ORDER NO. HAD85052538C0
A2

Service Manual

Cassette Deck

RS-B49R

dbx*/Dolby B-C NR Auto-Reverse Cassett

** DOLBY B-C NR

Color

(K)...Black Type
(S)...Silver Type

Color	Areas
(S)	[M] .....U.S.A.
(S)	[MC].....Canada.
(K) (S)	[E].....All European areas except United Kingdom.
(K) (S)	[EK] .....United Kingdom.
(K) (S)	[EGA]...F.R. Germany.
(K) (S)	[EH] .....Holland.
(K) (S)	[XA] .....Asia, Latin America, Middle East and Africa.
(K) (S)	[XL] .....Australia.
(K)	[PA] .....Far East PX.
(K)	[PE] .....European Military.

RS-B49R MECHANISM SERIES

SPECIFICATIONS

Deck system: Stereo cassette deck
Track system: 4-track, 2-channel
Heads: (Combination)
REC/PLAY; MX head
Erasing; Double-gap ferrite head
Motor: 1 motor
Recording system: AC bias
Bias frequency; 80 kHz
Erasing system: AC bias
Tape speed: 4.8 cm/sec. (1⅞ ips)
Frequency response:
Metal; 20 Hz~17,000 Hz
30 Hz~17,000 Hz (DIN)
40 Hz~16,000 Hz±3dB
CrO_2; 20 Hz~17,000 Hz
30 Hz~16,000 Hz (DIN)
40 Hz~15,000 Hz±3dB
Normal: 20 Hz~16,000 Hz
30 Hz~15,000 Hz (DIN)
40 Hz~14,000 Hz±3dB
Dynamic range:
(with dbx in) 110 dB (1 kHz)
S/N: (signal level=max. recording level, CrO_2 type tape)
dbx in; 92 dB (A weighted)
Dolby C NR in; 75 dB (CCIR)
Dolby B NR in; 67 dB (CCIR)
NR out; 57 dB (A weighted)
Wow and flutter: 0.08% (WRMS)
±0.14% (DIN)
Max. input level improvement:
(with dbx in) 10 dB (1 kHz)
Fast Forward and Rewind time:
Approx. 90 seconds with C-60 cassette tape
Input sensitivity and impedance:
MIC; 0.25 mV/400Ω~10 kΩ
LINE; 60 mV/47 kΩ
Output voltage and impedance:
LINE; 400 mV/1.5 kΩ
HEADPHONES; 80 mV/8Ω
Power consumption: 20 W
Power supply: [M][MC] .....AC 60 Hz 120V
[E][EH][EGA].....AC 50/60 Hz 220V
[EK][XA][XL] .....AC 50/60 Hz
[PA][PE] 110V/127V/220V/240V
Preset Power Voltage 240V
Dimensions (W×H×D) 430×100.5×229.5 mm
(16 29/32" × 3 31/32" × 9 1/32")
Weight: 3.6 kg (7 lbs. 15 oz.)

Design and specifications are subject to change without notice.

*The term dbx is a registered trademark of dbx Inc.

**'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

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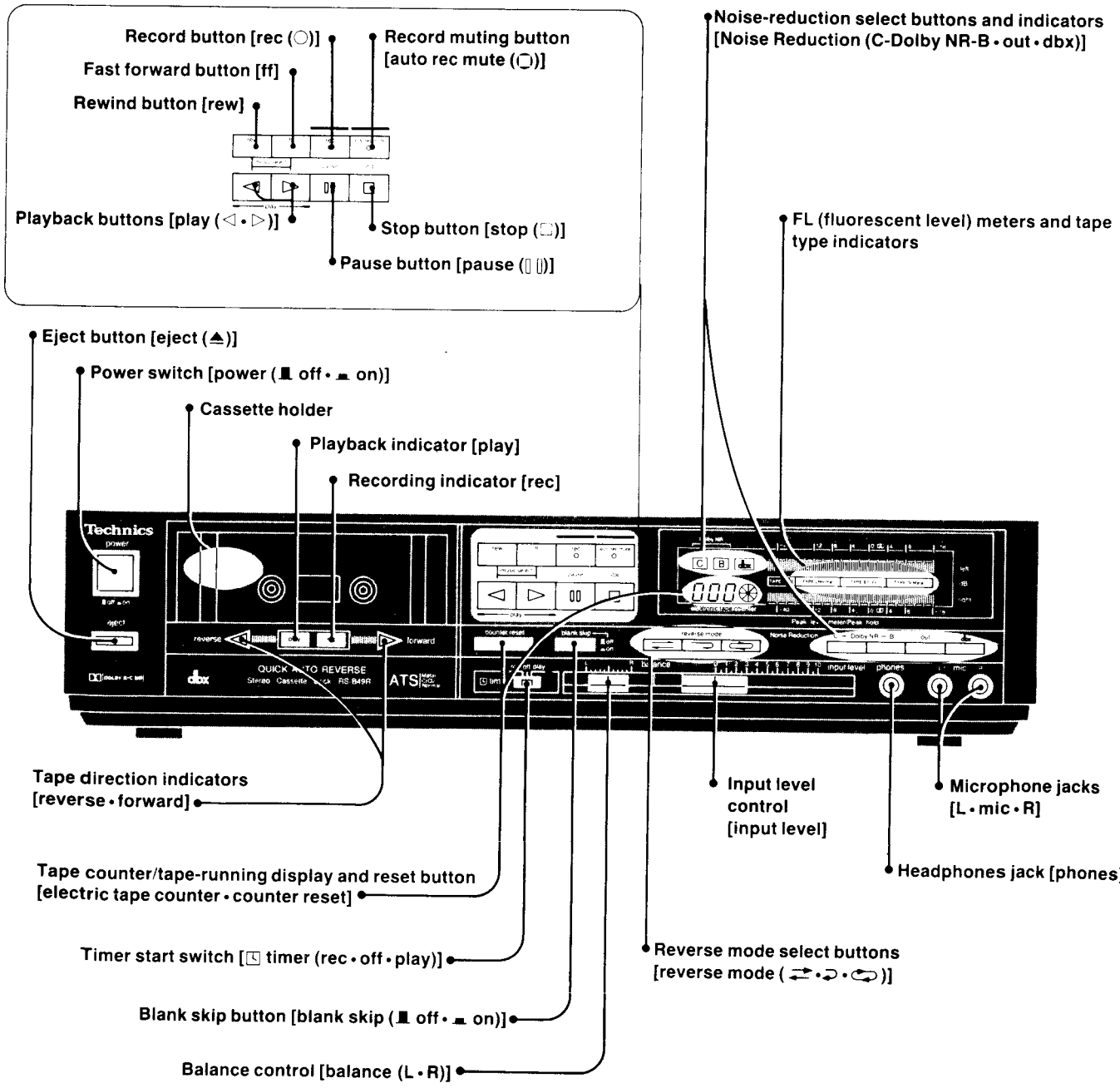
■ LOCATION OF CONTROL


Record button [rec (○)]
Record muting button [auto rec mute (○)]
Fast forward button [ff]
Rewind button [rew]
Playback buttons [play (◁ • ▷)]
Stop button [stop (□)]
Pause button [pause (▯▯)]
Noise-reduction select buttons and indicators [Noise Reduction (C-Dolby NR-B • out • dbx)]
FL (fluorescent level) meters and tape type indicators
Eject button [eject (▲)]
Power switch [power (▮ off • ▬ on)]
Cassette holder
Playback indicator [play]
Recording indicator [rec]
Technics
power
eject
reverse
forward
dbx
QUICK AUTO REVERSE
ATS
counter reset
blank skip
reverse mode
Noise Reduction
input level
phones
mic
Tape direction indicators [reverse • forward]
Input level control [input level]
Microphone jacks [L • mic • R]
Headphones jack [phones]
Tape counter/tape-running display and reset button [electric tape counter • counter reset]
Timer start switch [timer (rec • off • play)]
Reverse mode select buttons [reverse mode (⇄ • ↻ • ↻)]
Blank skip button [blank skip (▮ off • ▬ on)]
Balance control [balance (L • R)]

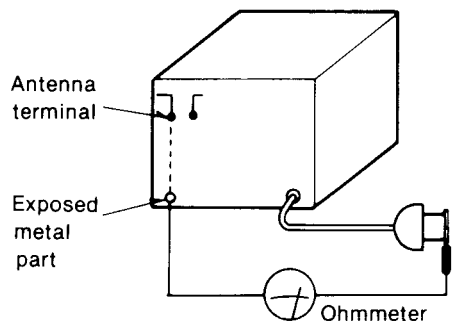
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.).

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

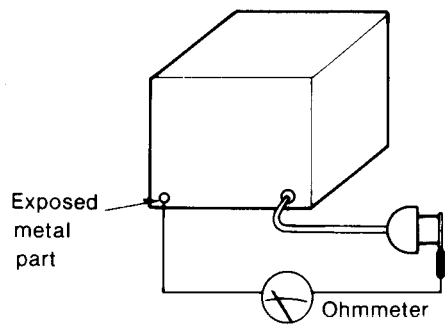
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

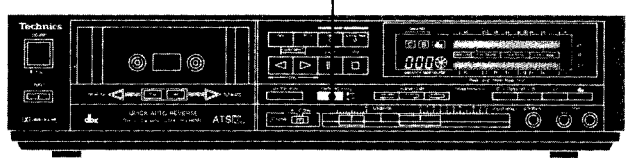
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ OPERATION

Blank skip function

The blank-skip function is provided so that unrecorded portions (approx. 14 seconds or longer) on the tape can be passed over quickly for playback of the next tune.

1 **Press before (or during) playback.**
If there is an unrecorded portion on the tape, fast forward begins after about 14 seconds; at the end of the unrecorded part, there is an automatic change to playback. (The playback indicator will flash rapidly during the blank-skipping.)



2 **To cancel the blank-skip function, press the blank-skip button once more.**

If the stop button or pause button is pressed, the tape will stop, but the blank-skip function will not be cancelled.

Automatic-reverse system

This function makes it possible to automatically change the direction of recording or playback without ejecting the cassette and then re-inserting it.

■ Quick-reverse

This unit is equipped with a quick-reverse system.
The system functions by detection of the point where the regular magnetic tape and the leader tape are joined together, and then automatically changes the direction of tape playback (or recording) in about one second.

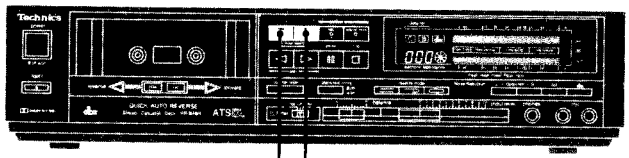
Note:

The quick-reverse system might not function as expected under the following conditions:

- If a very bright light (direct sunlight, a spotlight, etc.) is shining into the cassette holder, or if this unit is subjected to a strong impact shock.
- If dirt or other foreign material is on the tape, or if it is wrinkled or creased.
  (Quick-reverse will repeatedly occur at that point.)
- The quick-reverse mechanism does not function during the approximately first 15 seconds of playback or recording. This is in order to avoid incorrect quick-reverse operation on the leader tape if the playback (or recording) is started from the leader tape.

Tune selection

1 Press the playback button corresponding to the direction of playback you want to select.



2A Press to listen to a tune ahead on the tape.
(The search for the tune beginning will start; the playback indicator flashes rapidly.)

2B Press to listen to a tune before on the tape.
(The search for the tune beginning will start; the playback indicator flashes rapidly.)

Note:

The tune-select system will not function correctly under the following conditions:

- If the blank portion between tunes is less than 4 seconds.
- If there is excessive noise between tunes.
- If there is a very low-sound level place, or an unrecorded space, during a tune.
- If the tape has been recorded by using fade-in and/or fade-out* techniques.

***Fade-in and Fade-out**

Fade-in is a recording technique to gradually increase the sound (from 0 to the ordinary level) at the beginning of a recording. Fade-out is to gradually decrease the sound (from the ordinary level to 0) at the end of a recording.

Music select system manufactured under license of Starr. S.A., Bruxelles, Belguim.

Record-muting

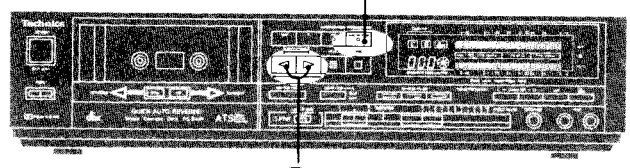
This feature makes it possible to make a non-recorded portion on the tape while a recording is in progress.
This feature should be used at the following times:

- To avoid recording unwanted commercial announcements and to avoid recording the noise produced when the phono needle descends to a disc.
- To make the non-recorded portion between tunes which is necessary so that the music select system can function properly. (See page 8.)

During recording...

1 • Press once.
(After about 4 seconds, the unit will automatically change to the recording stand-by mode.)

• Press for more than about 4 seconds.
(The unit will automatically change to the recording stand-by mode when the button is released.)



2 To resume the recording, press the button corresponding to the direction of recording you want to select.

■ DISASSEMBLY INSTRUCTION

Ref. No. 1	How to remove the case cover
Procedure 1	• Remove the 4 setscrews (❶~❹).

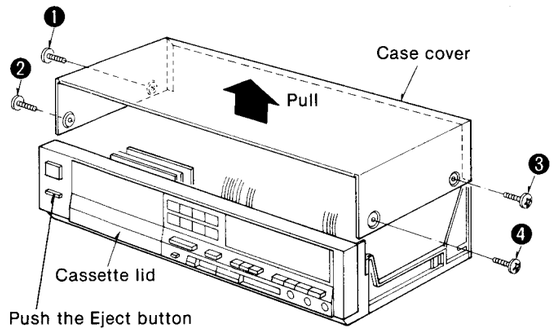


Fig. 1

Ref. No. 2	How to remove the main P.C.B.
Procedure 1 → 2	• Remove the setscrew (❶), and then remove the AC socket angle. • Push the 4 tabs aside, and then pull down the back chassis. • Remove the 2 setscrews (❹, ❺) and than remove the erase plate. • Remove the 2 setscrews (❷, ❸). • Remove Main P.C.B. in the direction of arrow Ⓐ.

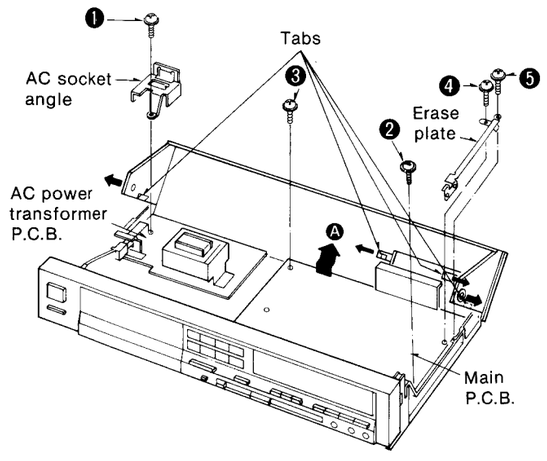


Fig. 2

Ref. No. 3	How to remove the meter P.C.B.
Procedure 1 → 3	• Remove the 5 setscrews (❶~❺), and then remove the shield angle. • Push the 2 tabs aside.

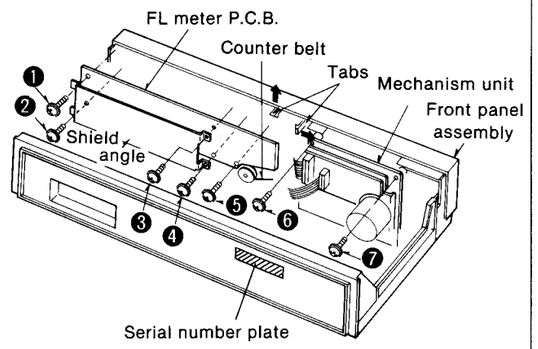


Fig. 3

Ref. No. 4	How to remove the mechanism unit
Procedure 1 → 4	• Push the eject button (see fig. 1). • Remove the 2 setscrews (❻, ❼) (see fig. 3). • Remove the 3 setscrews (❸~❺).

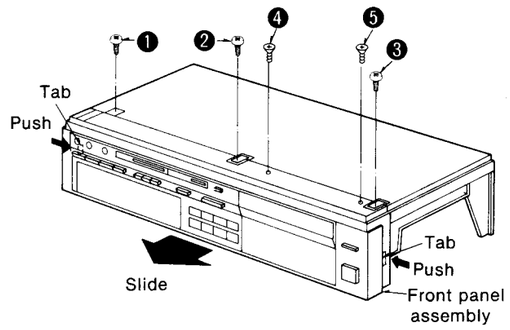


Fig. 4

Ref. No. 5	How to remove the front panel assembly
Procedure 1 → 5	• Remove the 4 connectors (A, B, C, W) and 6 flat cables (b, c, f, g, i, x). • Remove the 3 setscrews (❶~❸) (see fig. 4). • Push the 2 tabs aside (see fig. 4).

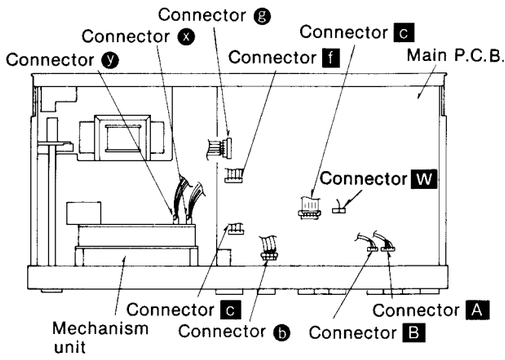
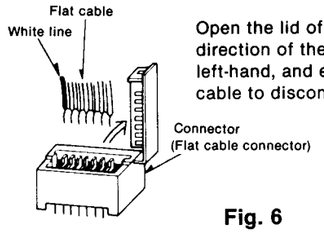


Fig. 5

How to remove flat cable



Open the lid of connector in the direction of the arrow as shown left-hand, and extract the flat cable to disconnect.

Fig. 6

• How to remove the head lead connector

Pull the connector with pincers alternatively on the right and left sides as shown by the arrows.

• How to insert the head lead connector

Match the projections of the connector with the marks printed on the P.C.B. and then insert the connector completely.

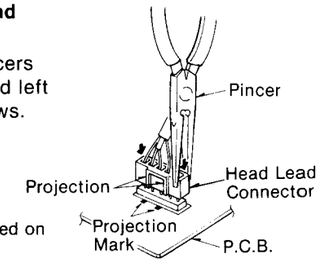


Fig. 7

Ref. No. 6	How to remove the LED P.C.B.
Procedure 1 → 6	• Push the eject button. • Remove the cassette lid. • Push the 4 tabs aside.

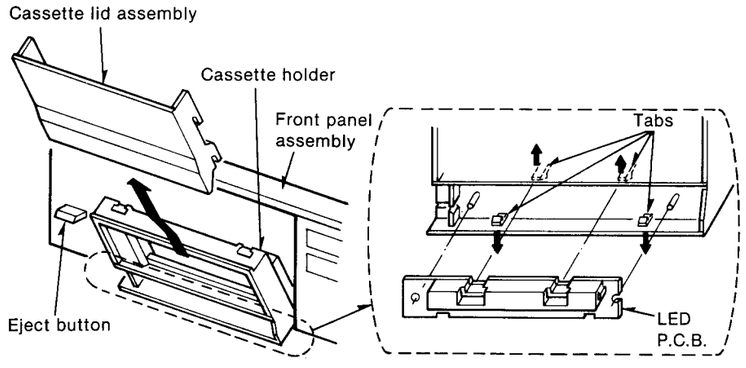


Fig. 8 Fig. 9

∗ Serial No. Indication

• The serial number plate of this product is attached to the back chassis (shown in fig. 3).

■ MEASUREMENT AND ADJUSTMENT METHODES

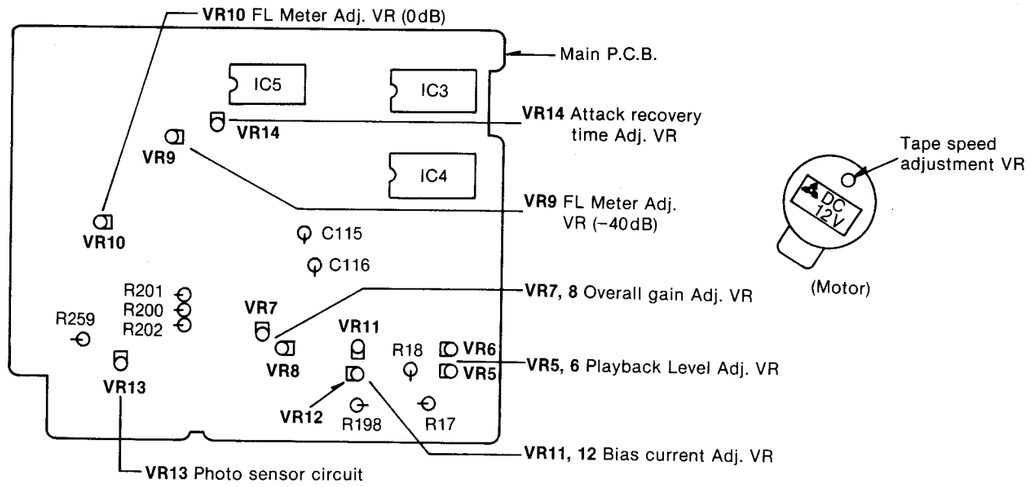


Fig. 1

NOTES: Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)
- NR switch: OUT
- Timer start switch: OFF
- Balance control: Center
- Input level control: Maximum
- Mode switch: ⬭ mode
- Blank skip switch: OFF

Ⓐ Head adjustment

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape (azimuth)...QZZCFM

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 2.
2. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM).
   Adjust the azimuth screw (Forward) shown in fig. 3 for maximum output L-CH and R-CH levels.
   When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.
3. Turn the azimuth screw (Forward) shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 3 and 4.)
4. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

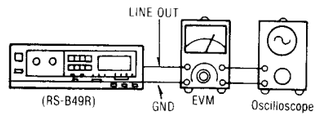


Fig. 2

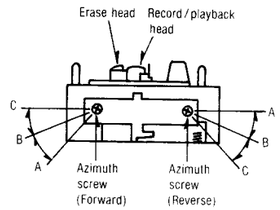


Fig. 3

L-CH/R-CH phase adjustment

5. Make connections as shown in fig. 5.
6. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 3 so that pointers of the two EVMs swing to maximum and a lissajous waveform as illustrated in fig. 6 is obtained on the oscilloscope.
7. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

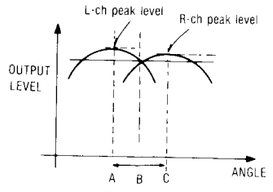


Fig. 4

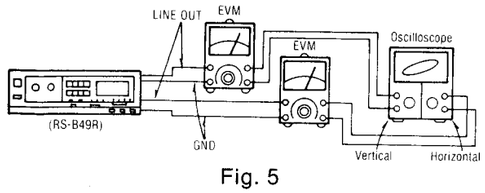


Fig. 5

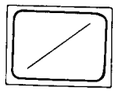


Fig. 6

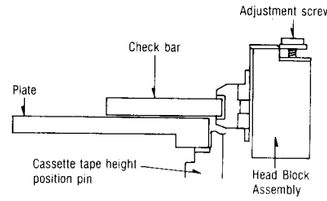
Checking the difference in level between forward and reverse running

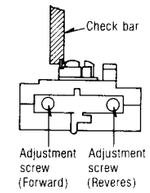
8. Reproduce the playback level adjustment signal (315Hz at 0dB) on the standard playback adjustment tape, and check that the difference between the level in forward running and that in reverse running is within 1.0dB.
9. After adjustment, lock the adjustment screws.

Head Height Adjustment using the Head Adjustment Jig (QZZ0207)

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

a. Place the plate onto the mechanism.
b. Set the mechanism to the PLAY mode.
c. Place the check bar onto the plate.
d. Pass the check bar through each tape guide.
e. Adjust the height screw so that the check bar does not touch any of the tape guides.
f. Run a mirror tape (QZZCRD) and check to see that the tape does not touch (twist arround, etc.) the tape guide.
g. After that, adjust items 1 thru 7 in the adjustment procedure.





Ⓑ Tape speed

Condition:
- Playback mode

Equipment:
- Digital frequency counter
- Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 7.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:

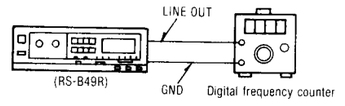


Fig. 7

$$\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100(\%)$$ where, f = measured value

5. Take measurement at middle section of tape.

Standard value: ±0.33% [3000±10Hz]

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.
   Note: Please use non metal type screwdriver when you adjust tape speed accuracy on this unit.

Tape speed fluctuation

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100(\%)$$ f_1 = maximum value, f_2 = minimum value

Standard value: Less than 1.5%

Ⓒ Playback frequency response

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 8).

Playback frequency response chart

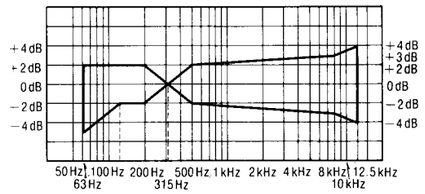


Fig. 8

Ⓓ Playback gain

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using EVM, measure the output level at LINE OUTs.
3. Make measurements for both channels.

Standard value: 0.4V±0.05V

Adjustment
1. If the measured value is not within the standard, adjust VR5 (L-CH) or VR6 (R-CH) (See fig. 1).
2. After adjustment, check "Playback frequency response" again.

Ⓔ Erase current

Condition:
- Record mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape (reference blank tape) ...QZZCRZ for Metal

1. Test equipment connection is shown in fig. 9.
2. Insert the metal reference blank test tape (QZZCRZ).
3. Press the record and pause buttons.
4. Read voltage on EVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R198}}{1\ (\Omega)}$$

Standard value: 190^{+10}_{-15}mA (Metal) (190^{+10}_{-15}mV)

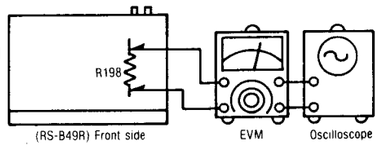


Fig. 9

5. If the measured value is not within the standard value adjust it by following the adjustment instructions.

Adjustment
1. Short-circuit the resistors R200, R201 and R202 (Refer to table 1).
2. Measure the erase current.
3. If the measured value is not within the standard value, open or short-circuit the resistors R200, R201 and R202 according to table 1.

R200	R201	R202	Change in value	Illustrations
Short	Short	Short	±0mA	R200 R201 R202 Soldered
Short	Short	Open	+4mA	R200 R201 R202 Soldered
Open	Short	Short	+10mA	R200 R201 R202 Soldered
Open	Open	Open	+20mA	R200 R201 R202

Table 1

Ⓕ Overall frequency response

Condition:
- Record/playback mode
- Normal tape mode
- CrO_2 tape mode
- Metal tape mode
- Input level controls...MAX
- Balance control...Center

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal ...QZZCRX for CrO_2 ...QZZCRZ for Metal

Note:
Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).
(Recording equalizer is fixed)
1. Make connections as shown in fig. 11.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is −20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 14kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 5, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 10). (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)
   If the curve is not within the charted specifications, adjust as follows;

Overall frequency response chart (Normal)

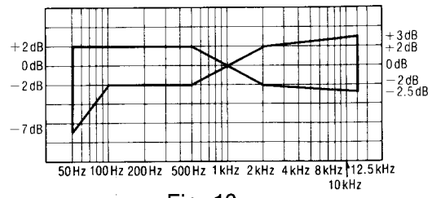


Fig. 10

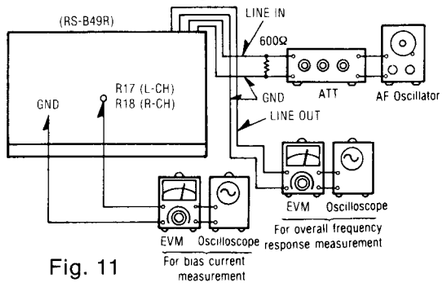


Fig. 11

Adjustment (A):
When the curve exceeds the overall specified frequency response chart (fig. 10) as shown in fig. 12.
1) Increase bias current by turning VR11 (L-CH) and VR12 (R-CH). (See fig 1)
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 10.)
3) If the curve still exceeds the specifications (fig. 10), increase bias current further and repeat steps 5 and 6.

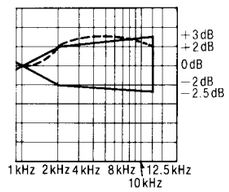


Fig. 12

Adjustment (B):
When the curve falls below the overall specified frequency response chart (fig. 10) as shown in fig. 13.
1) Reduce bias current by turning VR11 (L-CH) and VR12 (R-CH).
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 10.)
3) If the curve still falls below the charted specifications (fig. 10), reduce bias current further and repeat steps 5 and 6.

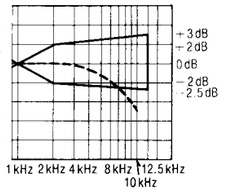


Fig. 13

7. Place UNIT into CrO_2 tape mode.
8. Change test tape to CrO_2 reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 14kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO_2 tapes (fig. 14).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 14kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    - Read the voltage at the terminals of resistor R17 (L-CH) {R18 (L-CH)}, and calculate the bias current from the following formula.

$$\text{Bias current (A)} = \frac{\text{Value read on EVM (V)}}{10\ (\Omega)}$$

Standard value:
around 420μA (Normal position)
around 560μA (CrO_2 position)
around 900μA (Metal position)

Overall frequency response chart (CrO_2, Metal)

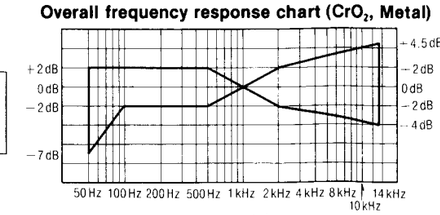


Fig 14

G Overall gain

Condition:
- Record/playback mode
- Input level controls...MAX
- Standard input level;
  MIC .....−72dB±4dB (0.25mV)
  LINE IN ...−24dB±4dB (60mV)

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal

1. Test equipment connection is shown in fig. 15.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (−24dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.4V±0.05V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.4V±0.05V.
7. If measured value is not 0.4V±0.05dB, adjust it by using VR7 (L-CH) or VR8 (R-CH).
8. Repeat from step (2).

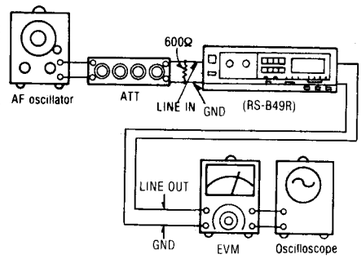


Fig. 15

H Fluorescent meter

Condition:
- Record mode
- Input level controls...MAX

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator

• Check for FL meter

To check the accuracy of the FL meter, measure the output level at LINE OUT.

1. Make connections as shown (See fig. 15).
2. In the recording pause mode, apply 1kHz (−24dB) to LINE IN.
3. Adjust ATT so that output level at LINE OUT is 0.4V±0.05V.

Checking FL meter 0dB segment display ON/OFF

Change the output level at LINE OUT from 0.4V−0.05V to 0.4V + 0.05V by adjusting the attenuator, and check that the FL meter 0dB segment display OFF state changes to the ON state.

Checking FL meter −40dB segment display ON/OFF

Lower the signal level 28dB below the standard input level (−24dB−28dB = −52dB≒2.5mV) and then further lower the level 12dB (−52dB−12dB = −64dB≒0.63mV) by adjusting the attenuator. While lowering the level as described above, make sure that only the −40dB display remains lit the dims or goes off at the lowest level.

• Adjustment for FL meter

1. Make connections as shown (See fig. 15).
2. In the recording pause mode, apply 1kHz (−24dB) to LINE IN.
3. Adjust ATT so that output level at LINE OUT becomes 0.4V±0.05V.

−40dB adjustment

4. Adjust ATT so that the level adjusted at step 3 is reuced by 40dB.
5. At this time, check that −40dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 16).
6. If the indicator is not lighted halfway as described in step 5, adjust VR9.

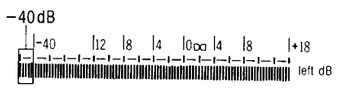


Fig. 16

0dB adjustment

7. Restore the condition of step 3 (set output level to 0.4V±0.05V at LINE OUT.
8. At this time, check that 0dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 17).
9. If improper, adjust VR10.
10. Repeat adjustments at steps 3, 4, 5, 6, 7, 8 and 9 two or three times.

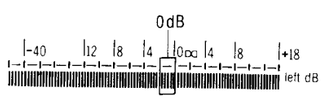


Fig. 17

I Dolby NR circuit

Condition:
- Record mode/playback mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch ...B/C
- Input level controls...MAX
- Balance control...center

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- Resistor (600Ω)
- AF oscillator
- Oscilloscope

Record side

• Check of the Dolby-B type encoder characteristics

1. Make connections as shown in fig. 18.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at Pin 7 of IC3 (L-CH) and IC4 (R-CH) is 12.3mV.
5. The output level at pin 21 should be 0dB. (375mV)
6. Set the NR select switch to B, and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is +6dB±2dB (753mV).
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 21 should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is +8dB±2dB (948mV).

• Check of Dolby-C type encoder characteristics

9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is 11.5dB±2dB (1.4V).
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 21 should be 0dB (375mV).
12. Set the NR select switch to C and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is 8.5dB±2dB (1V).

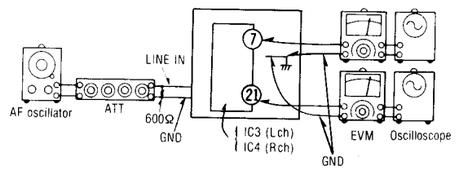


Fig. 18

J Attack recovery time adjustment (dbx circuit)

Condition:
- Record mode
- Input level control...MAX
- Noise reduction selector ...dbx
- Balance control...Center

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator
- DC voltmeter

Record side

1. Make the connections as shown in fig. 19 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx IN position.
2. Set the unit to record mode, adjust ATT so that the signal level at C115 (L-CH) and C116 (R-CH) is 300mV.
3. Read voltage on DC voltage meter.

Reference value: 15±0.5mV

4. If measured value is not within reference, adjust VR14 (Shown in Fig. 1).

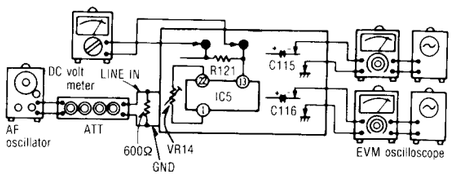


Fig. 19

K Photo sensor circuit

Condition:
- Playback mode

NOTE:

When adjusting the photo sensor circuit, leave the front panel, cassette lid and indication plate in place. (External light can cause the photo sensor in the cassette holder to malfunction and makes accurate adjustment impossible.)

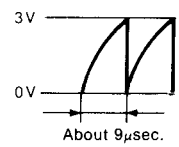
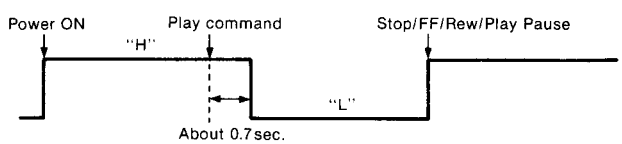
Sensitivity adjustment

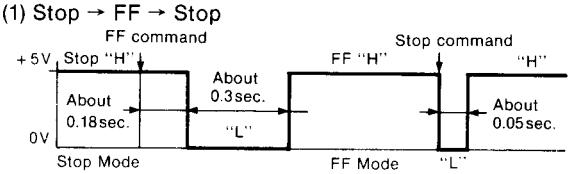
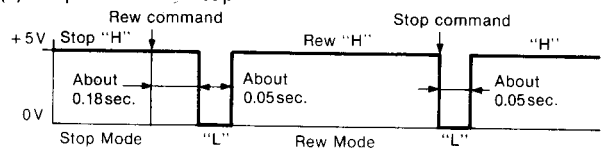
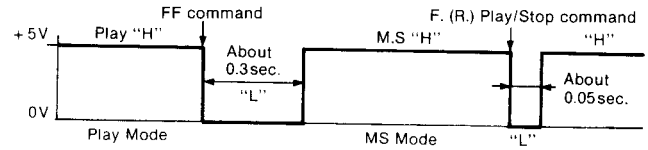
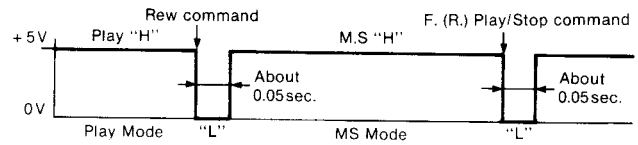
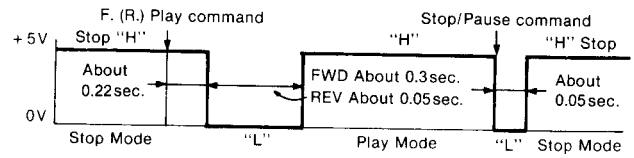
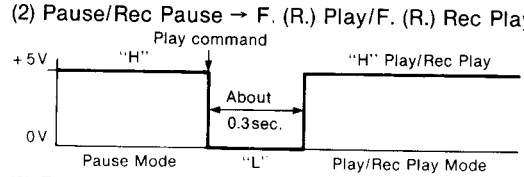
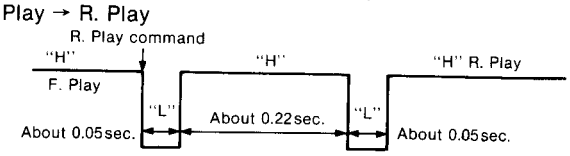
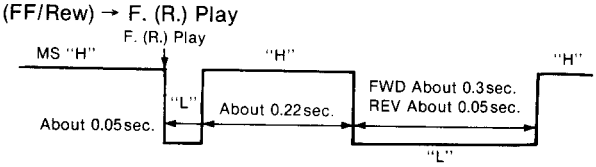
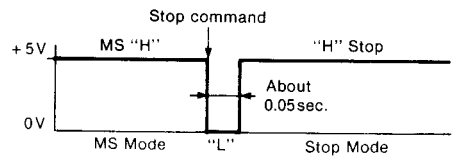
Some malfunctions, such as tape reverse or auto stop, may sometimes occur during tape travel according to type and make of tape. If the trouble is caused only by tape wrinkles, perform, the following adjustments.

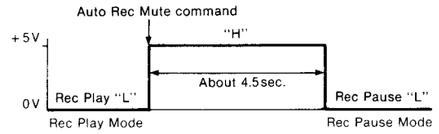
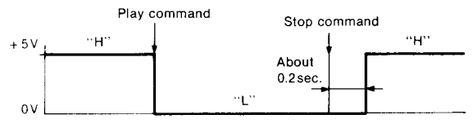
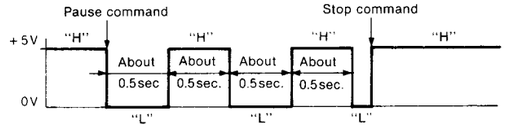
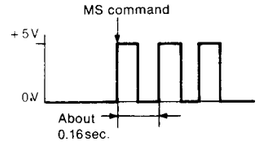
1. While playing the section causing malfunction, adjust VR13 so that normal operation is obtained. (Shown in fig. 1).
2. Then play the leader tape section and check for normal operation (that tape reverse and auto stop are eliminated).

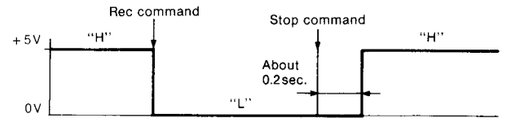
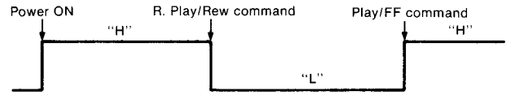
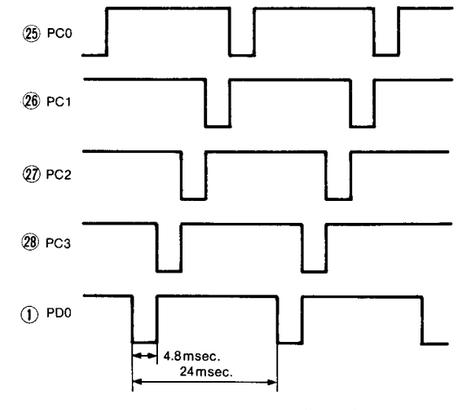
■ LM6413E1826 (IC901), LM6417E589 (IC301) EACH TERMINAL FUNCTION AND WAVEFORM

- **LM6413E1826**

Terminal No.	Symbol	Name	Function/operation
2.	PD1	Derection SW	Connected to GND.
3.	PD2	Quick IN	• (⟲) MODE The operation is reversed at the edge of L → H of PD2 about 15sec. or more after PLAY command. The edge of L → H within about 15sec. after PLAY command or reversing is ignored. • (⟳), Rev Play MODE Stop at the edgs of L → H ＊15sec. INH TIME is present. • (⟲), (⟳), Rev Rec Play MODE Edgs of L → H is ignored ＊15sec. INH TIME is present.
4.	PD4	MSP IN	• If PD3 is at "L" for about 14sec. in PLAY mode with BLANK SKIP switch ON, then the mode changes to CUE MS. PD3—"L" no signal portion "H" signal portion
5. 6.	EXtal Xtal	Clock oscillation	• Clock oscillation of about 180kHz. • This terminal should be blank during other measurement to keep it free from the influence of the probe. 
7.	INT	Reel table pulse input	• Rotation of reel base (with ring magnet) is detected by Hall IC for the detection of tape end. • Rectangular wave input in PLAY, FF, REW, MS.
8.	RST	Reset	• Used to reset the microcomputer when power is thrown in. • Reset at "L" level (0.3V_{DD} or less).
9.	DE0	Audio muting	 • When the mode is shifted from Stop to Play. The level goes "L" about 0.7sec. after play command. • When the mode is shifted from Pause to Play. The level gone "L" about 0.5sec. after play command. • When the mode is shifred from Stop to Rec Play. The level gone "L" about 0.5sec. after play command. • When the mode is shifted from MS to Play. The level gone "L" about 0.8sec. after play command.
10.	PE1	Motor out	• "H" in Stop mode. "L" in other modes.

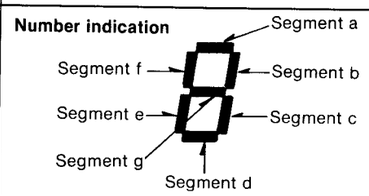
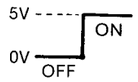
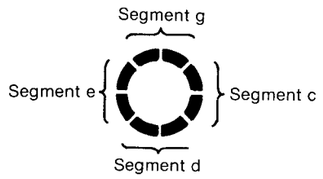
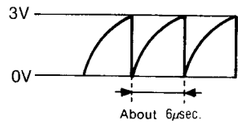
Terminal No.	Symbol	Name	Function/operation
11.	PE2	FF/Rew plunger out	• "L" for a short time in FF/REW/MS operation changeover. (1) Stop → FF → Stop  (2) Stop → Rew → Stop  (3) Play → MS (FF) → F. (R.) Play/Stop  (4) Play → MS (Rew) → F. (R.) Play/Stop 
12.	PE3	Play plunger out	• "L" for a short time in Play/Rec Play/MS operation changeover. (1) Stop → F. Play → Stop/Pause  (2) Pause/Rec Pause → F. (R.) Play/F. (R.) Rec Play  (3) F. Play → R. Play  (4) MS (FF/Rew) → F. (R.) Play  (5) MS (FF/Rew) → Stop 

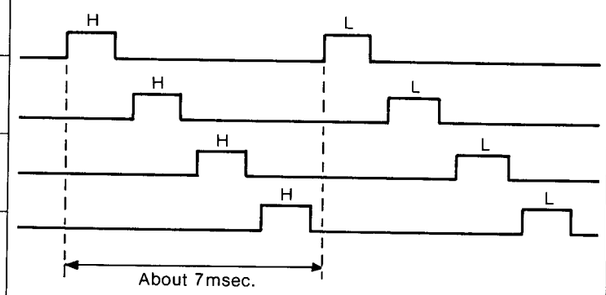
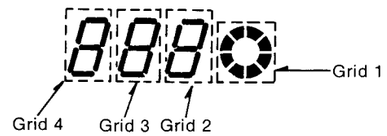
Terminal No.	Symbol	Name	Function/operation
13.	TEST	TEST	Connected to GND.
14.	Vss	GND	Earth.
15.	RF0	Rec mute	• In REC PAUSE mode, "H" with AUTO REC MUTE button pressed; "L" with the button released. • In REC PLAY mode, (1) "H" with AUTO REC MUTE button pressed, and about 4.5sec. later the mode changes to REC PAUSE, then the level goes "L". (2) If AUTO REC MUTE button is depressed for longer than about 4.5sec., the mode changes to REC PAUSE and the level goes "L" on releasing the button. (3) When PLAY button is pressed within 4.5sec. after pressing AUTO REC MUTE button, the mode changes to REC PLAY and the level goes "L". 
16.	PF1	Direction LED	• In FWD MODE "H". • In REV MODE "L". • In Power ON MODE "H".
17.	PF2	Play/Pause/MS indication	• In Play MODE.  (1) "L" with Play command received. (2) "H" about 0.2sec. after STOP command. (3) "L" immediately after power ON in Timer Play mode. • In Pause MODE  (1) "L" and "H" are repeated by about 1sec. cycle with PAUSE command received. (2) "H" with STOP command received. • In MS MODE 

Terminal No.	Symbol	Name	Function/operation
18.	PF3	Rec Indication	 (1) "L" with REC command received. (2) "H" about 0.2sec after STOP command. (3) "L" immediately after power ON in Timer REC mode.
19.	PG0	Up/Down command	 (1) In Power ON mode "H". (2) "L" with R. PLAY or REW button pressed. (3) "H" with F. PLAY or FF button pressed.
20.	VDD	Power supply	• Operative on about 5.2 volts.
21.	PA0	Input switch start reading	• The above-mentioned input is read according to the scanning of REW, AUTO REC MUTE, REV MODE ( ), REC INH (F), PC0, 1, 2, 3.
22.	PA1	Input switch start reading	• The above-mentioned input is read according to the scanning of FF, PAUSE, REV MODE ( ), REC INH (R), PC0, 1, 2.
23.	PA2	Input switch start reading	• The above-mentioned input is read according to the scanning of R, PLAY, REC, Timer PLAY, FF/REW MODE SW, PC0, 1, 2, 3.
24.	PA3	Input switch start recording	• The above-mentioned input is read according to the scanning of F, PLAY, STOP, Timer REC, BS SW, PLAY MODE SW, PC1, 2.
25.	PC0	Input scan	 When measuring scanning signal, pull up by connecting about 10kΩ resistor between ①, ㉕ ~ ㉘ pins and VDD.
26.	PC1	Input scan	
27.	PC2	Input scan	
28.	PC3	Input scan	
1.	PD0	Input scan	

(IC701: LM6417E589)

* This micro-computer is used for tape counter operation.

Terminal No.	Symbol	Name	Function/operation
1.	PDϕ	FL Counter Segment a	**Number indication**   **Running indication** 
2.	PD 1	FL Counter Segment b	
3.	PD 2	FL Counter Segment c	
4.	PD 3	FL Counter Segment d	
5.	OSC	Oscillation Terminal	• Clock oscillation of about 120 kHz.  Note) Do not connect anything to this terminal during other measurement because it will be otherwise affected by the probe.
6.	PEϕ	FL Counter Segment e	• Refer to PD ϕ~PD 3.
7.	PE 1	FL Counter Segment f	
8.	PE 2	FL Counter Segment g	
9.	PE 3	———	• Non connection.
10.	TEST	TEST	• Connection to GND.
11.	Vss	———	• Connection to GND.
12.	INT	———	• Non connection.
13.	RST	Reset Terminal	• Used to reset the microcomputer when power is thrown in. • Reset at "L" level (0.3 VDD or less).

Terminal No.	Symbol	Name	Function/operation
14.	VDD	Power Supply Terminal	• Operative on about 5.2 volts.
15.	PAϕ	———	• Non connection
16.	PA 1	Counter Reset Input	• In "L" level, counter indication is reset to 888..
17.	PA 2	Counter Up/Down Input	• Up counting with "H" level. • Down counting with "L" level.
18.	PA 3	Reel Table Pulse	• The rotation of reel table (with ring magnet) is detected by Hall IC (DN 6838-S), and the pulses are used to carry up or down for the counter. • With the takeup reel table rotated twice, the count number changes, and with it rotated 1/2, the running indication changes by one.
19.	PCϕ	FL Grid 1 & Input Scan	 
20.	PC 1	FL Grid 2 & Input Scan	
21.	PC 2	FL Grid 3 & Input Scan	
22.	PC 3	FL Grid 4 & Input Scan	

■ ELECTRICAL PARTS LIST

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

NOTES: RESISTORS
ERD.....Carbon
ERG .....Metal-oxide
ERS.....Metal-oxide
ERO .....Metal-film
ERX.....Metal-film
ERQ .....Fuse type metallic
ERC.....Solid
ERF.....Cement

CAPACITORS
ECBA .....Ceramic
ECG□ .....Ceramic
ECK□ .....Ceramic
ECC□ .....Ceramic
ECF□ .....Ceramic
ECQM.....Polyester film
ECQE .....Polyester film
ECQF .....Polypropylene
ECE□ .....Electrolytic
ECE□N ...Non polar electrolytic
ECQS .....Polystyrene
ECS□ .....Tantalum
QCS .....Tantalum

Areas

* [M] U.S.A.
* [MC] Canada.
* [E] All European areas except United Kingdom.
* [EK] United Kingdom.
* [EH] Holland.
* [EGA] F.R. Germany.
* [PA] Far East PX.
* [PE] European Military.
* [XA] Asia, Latin America, Middle East and Africa.
* [XL] Australia.

• RESISTORS

Ref. No.	Part No.	Value
R 1, 2	ERDS2TJ223	22k
R 3, 4	ERDS2TJ102	1k
R 5, 6	ERDS2TJ273	27k
R 7, 8	ERDS2TJ821	820
R 9, 10	ERDS2TJ224	220k
R 13, 14	ERD25TJ474	470k
R 15, 16	ERDS2TJ472	4.7k
R 17, 18	ERD25FJ100	10
R 19	ERD25FJ101	100
R 20	ERDS2TJ101	100
R 21, 22	ERDS2TJ224	220k
R 23, 24	ERDS2TJ124	120k
R 25, 26	ERDS2TJ432	4.3k
R 27, 28	ERDS2TJ472	4.7k
R 29, 30	ERDS2TJ183	18k
R 31, 32	ERDS2TJ472	4.7k
R 33, 34	ERDS2TJ562	5.6k
R 35, 36	ERDS2TJ272	2.7k
R 37, 38	ERDS2TJ102	1k
R 39	ERDS2TJ561	560
R 40	ERDS2TJ103	10k
R 43	ERDS2TJ563	56k
R 44	ERD25FJ221	220
R 45, 46	ERDS2TJ102	1k
R 47, 48	ERDS2TJ224	220k
R 49, 50	ERDS2TJ242	2.4k
R 51, 52	ERDS2TJ224	220k
R 53, 54	ERDS2TJ432	4.3k
R 55, 56	ERDS2TJ102	1k
R 57, 58	ERDS2TJ332	3.3k
R 59, 60	ERD25FJ512	5.1k
R 61, 62	ERDS2TJ683	68k
R 63, 64	ERDS2TJ222	2.2k
R 65, 66	ERDS2TJ333	33k
R 67, 68, 69, 70	ERDS2TJ823	82k
R 71, 72	ERDS2TJ222	2.2k
R 73, 74	ERDS2TJ103	10k
R 75, 76	ERD25FJ102	1k
R 77	ERD25TJ273	27k
R 80	ERDS2TJ223	22k
R 81, 82	ERDS2TJ223	22k
R 83, 84	ERD25FJ122	1.2k
R 85, 86	ERD25FJ472	4.7k
R 93, 94	ERDS2TJ153	15k
R 95, 96	ERDS2TJ472	4.7k
R 97, 98	ERDS2TJ333	33k
R 99, 100	ERD25TJ154	150k
R 101, 102	ERD25TJ224	220k
R 103, 104	ERDS2TJ472	4.7k
R 105, 106	ERDS2TJ103	10k
R 107, 108	ERDS2TJ472	4.7k
R 109, 110	ERDS2TJ153	15k
R 111, 112	ERDS2TJ151	150
R 113, 114	ERDS2TJ472	4.7k
R 115, 116, 117, 118	ERDS2TJ153	15k
R 119, 120	ERDS2TJ332	3.3k
R 121, 122	ERDS2TJ104	100k
R 123, 124	ERDS2TJ102	1k
R 125, 126	ERDS2TJ392	3.9k
R 127, 128	ERDS2TJ682	6.8k
R 129	ERD25FJ102	1k
R 130	ERDS2TJ123	12k
R 131, 132	ERDS2TJ103	10k
R 133	ERDS2TJ473	47k
R 134	ERDS2TJ103	10k
R 135	ERD25FJ331	330
R 136	ERDS2TJ103	10k
R 137, 138	ERG12SJ560P	56
R 141, 142, 143, 144	ERDS2TJ155	1.5M
R 145	ERDS2TJ562	5.6k
R 146, 147	ERD25FJ472	4.7k
R 148	ERD25FJ270	27
R 149, 150	ERD25FJ332	3.3k
R 151, 152, 153	ERDS2TJ102	1k
R 154	ERD25FJ102	1k
R 155, 156	ERDS2TJ680	68
R 157, 158	ERD25FJ182	1.8k
R 159, 160	ERD25FJ122	1.2k
R 161, 162	ERD25FJ122	1.2k
R 163, 164	ERDS2TJ222	2.2k
R 165, 166	ERDS2TJ103	10k
R 167, 168	ERDS2TJ272	2.7k
R 169, 170	ERDS2TJ123	12k
R 171	ERD25FJ472	4.7k
R 175, 176	ERD25FJ820	82
R 177	ERDS2TJ152	1.5k
R 178	ERDS2TJ332	3.3k
R 181, 182	ERDS2TJ222	2.2k
R 183, 184	ERDS2TJ392	3.9k
R 185	ERDS2TJ151	150
R 186	ERD25FJ151	150
R 187, 188	ERDS2TJ680	68
R 189, 190	ERD25FJ152	1.5k
R 191, 192	ERDS2TJ684	680k
R 193, 194	ERDS2TJ223	22k
R 196, 197	ERDS2TJ180	18
R 198	ERD25FJ1R0	1
R 200	ERDS2TJ103	10k
R 201, 202	ERDS2TJ223	22k
R 203	ERDS2TJ272	2.7k
R 204	ERDS2TJ222	2.2k
R 206	ERD25FJ103	10k
R 207	ERDS2TJ103	10k
R 208	ERDS2TJ152	1.5k
R 209	ERDS2TJ683	68k
R 210	ERDS2TJ390	39
R 211	ERDS2TJ103	10k
R 212	ERDS2TJ473	47k
R 213	ERDS2TJ102	1k
R 216	ERDS2TJ102	1k
R 217	ERDS2TJ333	33k
R 218	ERDS2TJ333	33k
R 219	ERDS2TJ563	56k
R 220	ERDS2TJ103	10k
R 222, 223	ERDS2TJ223	22k
R 224	ERDS2TJ472	4.7k
R 225	ERDS2TJ223	22k
R 226	ERDS2TJ272	2.7k
R 227	ERDS2TJ223	22k
R 228	ERDS2TJ103	10k
R 229	ERDS2TJ101	100
R 230, 231	ERDS2TJ103	10k
R 232	ERDS2TJ273	27k
R 233	ERDS2TJ183	18k
R 234	ERDS2TJ333	33k
R 236	ERDS2TJ153	15k
R 237	ERDS2TJ682	6.8k
R 238	ERD25FJ682	6.8k
R 239	ERDS2TJ681	680
R 240	ERDS2TJ561	560
R 241	ERDS2TJ563	56k
R 242	ERDS2TJ472	4.7k
R 243, 244	ERDS2TJ103	10k
R 245	ERDS2TJ272	2.7k
R 246	ERDS2TJ152	1.5k
R 247, 248	ERDS2TJ223	22k
R 249	ERDS2TJ471	470
R 250	ERDS2TJ103	10k
R 251	ERD25FJ182	1.8k
R 252	ERDS2TJ472	4.7k
R 253	ERD25TJ183	18k
R 255	ERDS2TJ472	4.7k
R 256	ERDS2TJ101	100
R 257	ERDS2TJ222	2.2k
R 258	ERDS2TJ102	1k
R 259	ERD25FJ472	4.7k
R 260, 261	ERDS2TJ103	10k
R 262	ERD25TJ105	1M
R 263	ERDS2TJ392	3.9k
R 264	ERDS2TJ102	1k
R 265	ERDS2TJ103	10k
R 266	ERDS2TJ473	47k
R 267	ERDS2TJ273	27k
R 268	ERDS2TJ561	560
R 269 [E][EK] ⚠	ERQ14LKR39E	0.39
R 270	ERDS2TJ103	10k
R 273, 274	ERD25FJ470	47
R 275, 276 ⚠	ERX2SJ4R7	4.7
R 277, 278 ⚠	ERDS2TJ681	680
R 279, 280 [E][EK] ⚠	ERQ14LKR56E	0.56
R 281, 282 ⚠	ERD25FJ181	180
R 285, 286, 287, 288, 289, 290	ERDS2TJ223	22k
R 291, 292	ERDS2TJ102	1k
R 293	ERD2FCG100	10
R 294	ERDS2TJ684	680k
R 301	ERDS2TJ472	4.7k
R 302	ERDS2TJ332	3.3k
R 303, 304, 305	ERDS2TJ333	33k
R 310	ERD25TJ223	22k
R 311	ERD25FJ472	4.7k
R 312	ERDS2TJ683	68k
R 313	ERD25TJ273	27k
R 314	ERD25FJ103	10k
R 315	ERD2FCG181P	180
R 316	ERDS2TJ472	4.7k
R 317	ERDS2TJ472	4.7k
R 318	ERDS2TJ473	47k
R 401	ERDS2TJ122	1.2k
R 880	ERDS2TJ681	680
R 882	ERDS2TJ681	680
R 885	ERD25FJ822	8.2k
R 886	ERDS2TJ332	3.3k
R 902	ERDS2TJ683	68k
R 903	ERDS2TJ273	27k
R 904	ERDS2TJ222	2.2k
R 905	ERDS2TJ102	1k
R 906	ERDS2TJ220	22
R 1000	ERDS2TJ103	10k

• CAPACITORS

Ref. No.	Part No.	Value
C 1, 2	ECEA1EU4R7	4.7
C 3, 4	ECKD1H102KB	0.001
C 5, 6	ECEA1HU010	1
C 7, 8	ECEA1EU4R7	4.7
C 11, 12	ECKD1H681KB	680p
C 13, 14	ECKD1H151KB	150p
C 15, 16	ECEA1AU101	100
C 17, 18	ECKD1H102KB	0.001
C 19, 20	ECQM1H273JZ	0.027
C 21, 22	ECEA1HU010	1
C 23, 24	ECQM1H123JZ	0.012
C 25, 26	ECCD1H470K	47p
C 27	ECFD1E104MD	0.1
C 28	ECQM1H104JZ	0.1
C 30	ECEA1AU101	100
C 31, 32, 33	ECKD1H223ZF	0.022
C 35, 36	ECEA1HUR33	0.33
C 37, 38	ECQM1H152JZ	0.0015
C 39, 40	ECQM1H122JZ	0.0012
C 41, 42	ECQM1H103JZ	0.01
C 43, 44, 45, 46	ECQM1H472JZ	0.0047
C 47, 48, 49, 50	ECEA1CU100	10
C 51, 52, 53, 54	ECQV05473JZ	0.047
C 55, 56, 57, 58	ECQM1H224JZ	0.22
C 59, 60, 61, 62	ECEA50ZR68	0.68
C 63	ECEB1EU4R7	4.7
C 64, 65, 66	ECEA1EU4R7	4.7
C 67, 68	ECEA1CU331	330
C 69, 70	ECEA1EU4R7	4.7
C 75, 76	ECEA1HU010	1
C 79, 80	ECEA1HUR68	0.68
C 81, 82	ECKD1H471KB	470p
C 83, 84	ECQM1H223JZ	0.022
C 85, 86	ECQM1H104JZ	0.1
C 89, 90	ECQM1H104JZ	0.1
C 91, 92	ECEA1HUR33	0.33
C 93, 94	ECQV05333JZ	0.033
C 95, 96	ECEA1CU100	10
C 97, 98	ECQM1H332JZ	0.0033
C 99, 100	ECQM1H472JZ	0.0047
C 101, 102	ECEA1AU470	47
C 103, 104	ECQM1H332JZ	0.0033
C 105, 106	ECKD1H391KB	390p
C 107, 108	ECQM1H223JZ	0.022
C 109, 110	ECKD1H331KB	330p
C 111, 112, 113, 114, 115, 116	ECEA1CU100	10
C 117	ECEA0JU331	330
C 118	ECEA1EU4R7	4.7
C 121, 122	ECQM1H183JZ	0.018
C 123, 124	ECQM1H682JZ	0.0068
C 125, 126	ECQM1H562JZ	0.0056
C 127, 128	ECQM1H183JZ	0.018
C 131, 132	ECQM1H822JZ	0.0082
C 135, 136	ECKD1H391KB	390p
C 137, 138, 139, 140	ECEA1HU010	1
C 141, 142	ECKD1H152KB	0.0015
C 143, 144	ECKD1H821KB	820p
C 145, 146	ECKD1H121KB	120p
C 151, 152	ECEA1HUR33	0.33
C 153, 154	ECEA1CN100	10
C 155, 156	ECKD1H102KB	0.001
C 157, 158	ECKD1H223ZF	0.022
C 159, 160	ECEA1HU010	1
C 161, 162	ECCD1H101J	100p
C 163, 164	ECQM1H472JZ	0.0047
C 165	ECQM1H562JZ	0.0056
C 166	ECQM1H472JZ	0.0047
C 167	ECEA1EU4R7	4.7
C 168	ECQP1183JZ	0.018
C 169, 170	ECKD1H102KB	0.001
C 171	ECEA1AU470	47
C 172	ECEA1HU010	1
C 174	ECEA1EU4R7	4.7
C 175	ECEA1HU3R3	3.3
C 176, 177	ECEA1CU100	10
C 178	ECEA0JU331	330
C 179	ECEA0JU101	100
C 180	ECKD1H102KB	0.001
C 181	ECEA1EU4R7	4.7
C 182	ECEA1CU100	10
C 183	ECEA1AU101	100
C 184	ECKD1H102KB	0.001
C 185, 186	ECEA1EU4R7	4.7
C 187	ECEA1HUR47	0.47
C 189, 190	ECKD1H223KB	0.022
C 191, 192 ⚠	ECKD1H223ZF	0.022
C 193 ⚠	ECEA1CS222	2200
C 194 ⚠	ECEA1CU102	1000
C 196	ECQM1H104JZ	0.1
C 197, 198 ⚠	ECEA1CU331	330
C 199 ⚠	ECEA1CS222	2200
C 301	ECKW1H223ZF	0.022
C 302	ECKW1H221KB	220p
C 303	ECEA1HU010	1
C 304	ECQV05473JZ	0.047
C 501	ECKDKC103PFZ	0.01
C 901	ECEA0JU101	100
C 902	ECEA1HU010	1
C 903	RCBS1H121K	120p

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description
IC 1	M5218L	Integrated Circuit
IC 2	M5220L	Integrated Circuit
IC 3, 4	TEA0665	Integrated Circuit
IC 5	AN6291	Integrated Circuit
IC 6	M5218L	Integrated Circuit
IC 7, 8	AN6203	Integrated Circuit
IC 9, 10, 11	M5218L	Integrated Circuit
IC 301, 302	AN6280	Integrated Circuit
IC 303	LM6417E589	Integrated Circuit
IC 304	AN6870N	Integrated Circuit
IC 901	LM6413E1826	Integrated Circuit
IC 902	DN6838-S	Integrated Circuit

IC PROTECTOR

Ref. No.	Part No.	Part Name & Description
ICP 901 [EK]	RAHICPF20	IC Protector

TRANSISTORS

Ref. No.	Part No.	Part Name & Description
Q 1, 2	2SC2603EFG	Transistor
Q 3, 4	2SD1468R	Transistor
Q 5, 6	2SC2603EFG	Transistor
Q 7, 8, 9	2SD1011-T	Transistor
Q 10	2SA921-T	Transistor
Q 11, 12, 13, 14	2SA1115E	Transistor
Q 15, 16, 17, 18, 19, 20, 21, 22	2SC2603EFG	Transistor
Q 23, 24	2SC1845-E	Transistor
Q 25, 26	2SA1115E	Transistor
Q 27	UN4211	Transistor
Q 29, 30	2SK381D	Transistor
Q 31, 32	2SJ40D	Transistor
Q 33, 34	2SD1330R	Transistor
Q 35, 36	2SA1115E	Transistor
Q 37, 38, 39, 40, 41, 42, 43	2SC2603EFG	Transistor
Q 45, 46, 47	2SD1225RM	Transistor
Q 48	2SA952L	Transistor
Q 49	2SC2603EFG	Transistor
Q 51, 52	2SC2603EFG	Transistor
Q 54	UN4111	Transistor
Q 55	2SB909Q	Transistor
Q 56	2SA1115E	Transistor
Q 57	UN4211	Transistor
Q 58	2SC2603EFG	Transistor
Q 59	2SA1115E	Transistor
Q 60	2SC2603EFG	Transistor
Q 61, 62, 63	UN4111	Transistor
Q 64	2SA1115E	Transistor
Q 65	2SC1740SQ	Transistor
Q 66, 67, 68	2SC2603EFG	Transistor
Q 70	UN4111	Transistor
Q 71	2SD1265-0	Transistor
Q 72	2SB941P	Transistor
Q 301	2SC2603EFG	Transistor
Q 901	2SD592A	Transistor
Q 902	2SB621A-R	Transistor
Q 903, 904	2SB1030R	Transistor
Q 1000	2SC2603EFG	Transistor

DIODES & RECTIFIERS

Ref. No.	Part No.	Part Name & Description
D 1, 3	1SS133T	Diode
D 4	MTZ5R6B	Diode
D 5, 6, 7	1SS133T	Diode
D 8	SVDMC921	Diode
D 10, 11, 12, 13, 14, 15	1SS133T	Diode
D 16	1SS53	Diode
D 19	MTZ6R8B	Diode
D 21, 22	1SS133T	Diode
D 23, 24	SVDMC911	Diode
D 27, 28	1SS133T	Diode
D 29	MTZ6R8B	Diode
D 30, 31, 32	1SS133T	Diode
D 33, 34 ⚠	SVDS1WB10	Rectifier
D 35, 36	MA4033M	Diode
D 37	MTZ22CT77	Diode
D 39	1S2473	Diode
D 40, 41	1SS133T	Diode
D 42, 43	MTZ22CT77	Zener
D 301, 302, 303, 304, 305, 306, 307, 308, 309, 310	1SS133T	Diode
D 312, 313, 314, 315, 316, 317	1SS133T	Diode
D 319	1SS133T	Diode
D 320, 321	MTZ22CT77	Zener
D 401, 402, 403	SLV31MC3	Diode Led
D 404	SLV31VC3	Diode
D 405	1SS133T	Diode
D 901	MA4056M	Diode
D 902, 903, 904, 905, 906, 907	1SS133T	Diode
D 1000	1SS133T	Diode

VARIABLE RESISTORS

Ref. No.	Part No.	Part Name & Description
VR 1	EWAMF5X05G15	Balance Control
VR 2, 3	EWAPA1X05A54	Input Level Control
VR 5, 6	QVNB3A00B101	P.B Level Adj VR
VR 7, 8	QVNB3A00B223	Overall Gain Adj VR
VR 9	QVNB3A00B222	FL Meter Adj VR (−40dB Indication)
VR 10	QVNB3A00B223	FL Meter Adj VR (0dB Indication)
VR 11, 12	QVNB3A00B104	Bias Current Adj VR
VR 13	QVNB3A00B103	Photo Sensor Sensitivity Adj VR
VR 14	QVNB3A00B222	Attack Recoverly Time Adj VR

COMBINATION PARTS

Ref. No.	Part No.	Part Name & Description
Z 1, 2	EXRP102K473T	Combination Parts
Z 3, 4	EXRP220K124T	Combination Parts
Z 5, 6	EXRP101K153T	Combination Parts
Z 7	EXRP470K683T	Combination Parts
Z 301	EXBF5E472J	Combination Parts
Z 302	EXBF12E472J	Combination Parts
Z 901	EXBF5E472J	Combination Parts

FLOURESCENT DISPLAY TUBE

Ref. No.	Part No.	Part Name & Description
FL 1	SADBG308ZK	FL Meter

COILS

Ref. No.	Part No.	Part Name & Description
L 1, 2	QLM9Z10K	MPX Coil
L 3, 4	ELM7Q306A	Skewing Network Coil
L 5, 6	QLQX0332KWA	Peaking Coil
L 7, 8	QLQX0343KWA	Bias Trap Coil
L 9	QLB0202K	Bias Oscillation Coil

TRANSFORMERS

Ref. No.	Part No.	Part Name & Description
T 1 [M] [MC] ⚠	SLT5L229W	Power Transformer
T 1 [E][EH] [EGA] ⚠	SLT5L240W	Power Transformer
T 1 [EK] [XL] ⚠	SLT5L241W	Power Transformer
T 1 [PA] [PE][XA] ⚠	SLT5L242W	Power Transformer

SWITCHES

Ref. No.	Part No.	Part Name & Description
S 1	QSS1306H	Slide Switch (Timer)
S 301, 302, 303, 304, 305, 306, 307, 308, 309	SSG13	Push Switch
S 311	SSG13	Push Switch
S 312	SSH1202	Push Switch (NR Selector)
S 313	SSH492	Push Switch (NR Selector)
S 315, 316	SSH3084	Push Switch (Mode Selector)
S 501 ⚠	ESB8215V	Push Switch (Power)
S 502 [EK][PA] [PE][XA] [XL] ⚠	SSR227	AC Voltage Selector Switch
S 901, 902	RSH1B12ZA-U	Life Switch (Play, FF/Rew)
S 903, 904, 905, 906	RSH1A46ZA-U	Life Switch (Rec INH ATS)

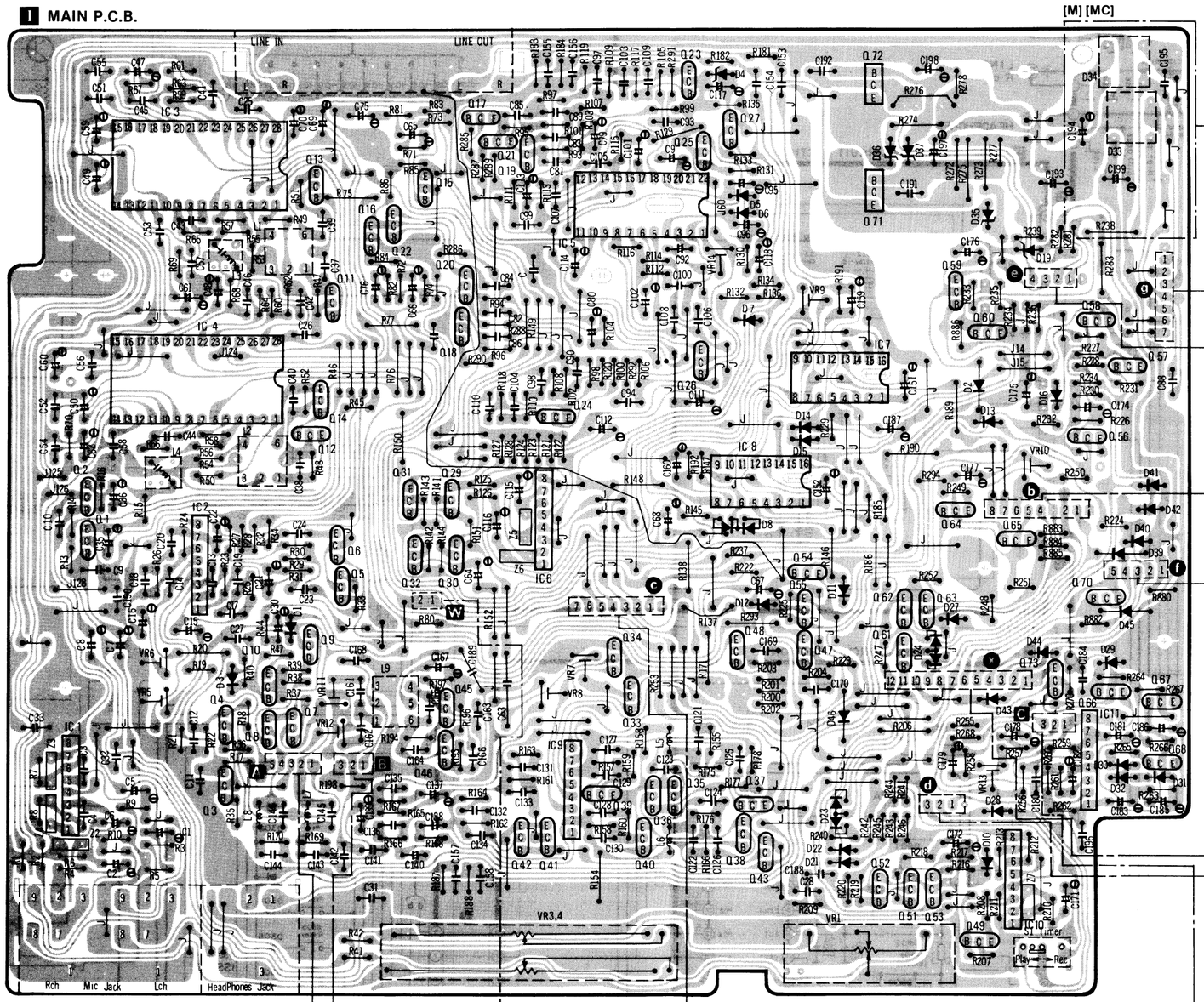
JACKS

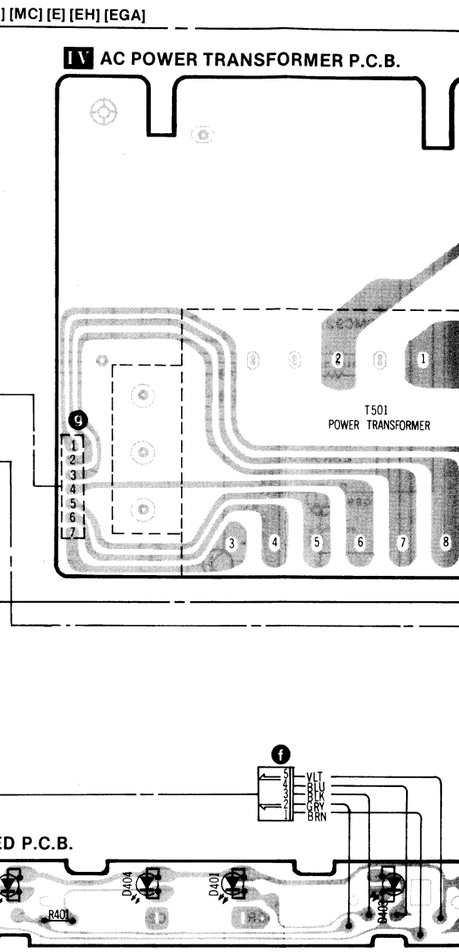
Ref. No.	Part No.	Part Name & Description
J 1	SJJ127HH	Microphone Jack
J 2	SJJ126B	Headphones Jack

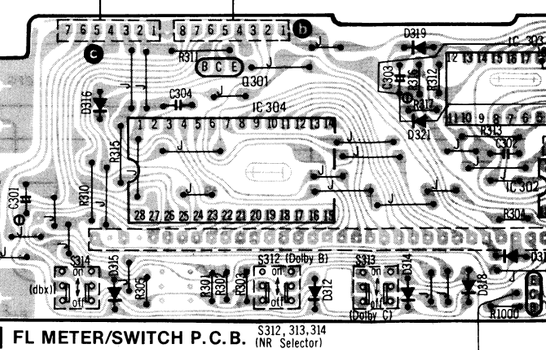
CONNECTORS

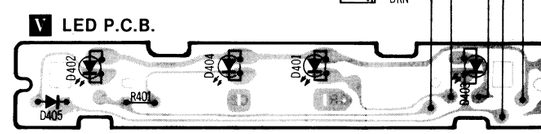
Ref. No.	Part No.	Part Name & Description
CN 1	B3B-PH	3p Plug
CN 2	B5B-PH	5p Plug
CN 3	QJS1997S	3p Socket
CN 4	QJS1962S	5p Socket
CN 5	QJS1983S	8p Socket
CN 6	QJS1987S	4p Socket
CN 7	SJT3511	5p Connector
CN 8	QJS1989S	10p Socket
CN 9	QJS1990S	12p Socket
CN 10	RJS1H1ZA	1p Socket
CN 11	SJT795	Contact
CN 12	SJS5523	5p Socket

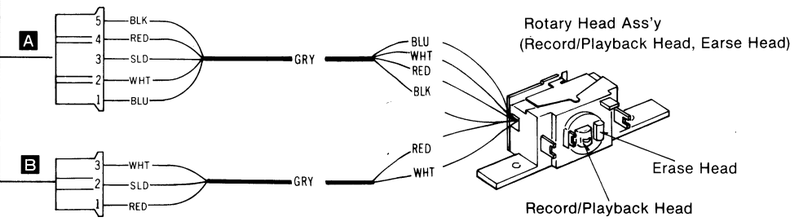
■ PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

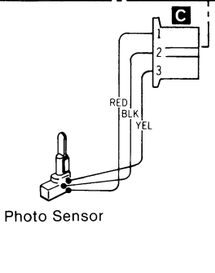






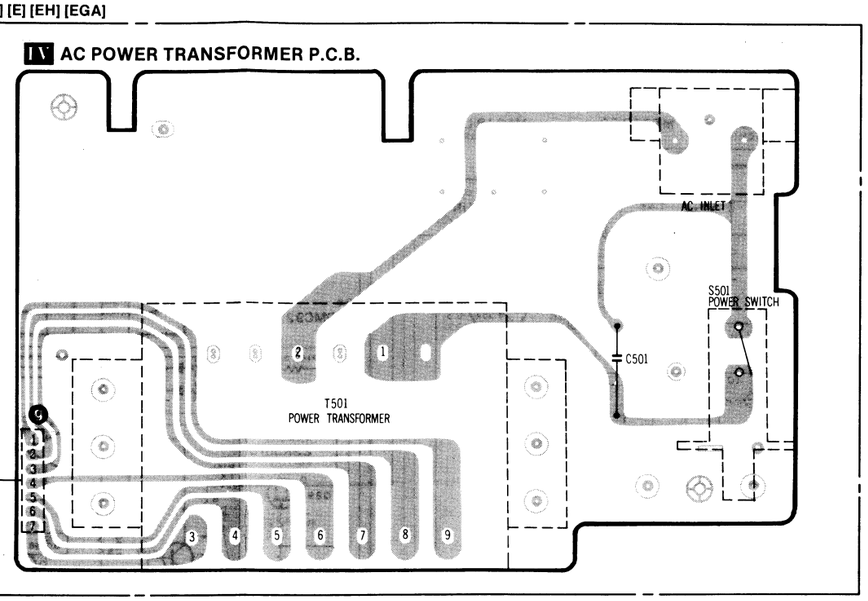






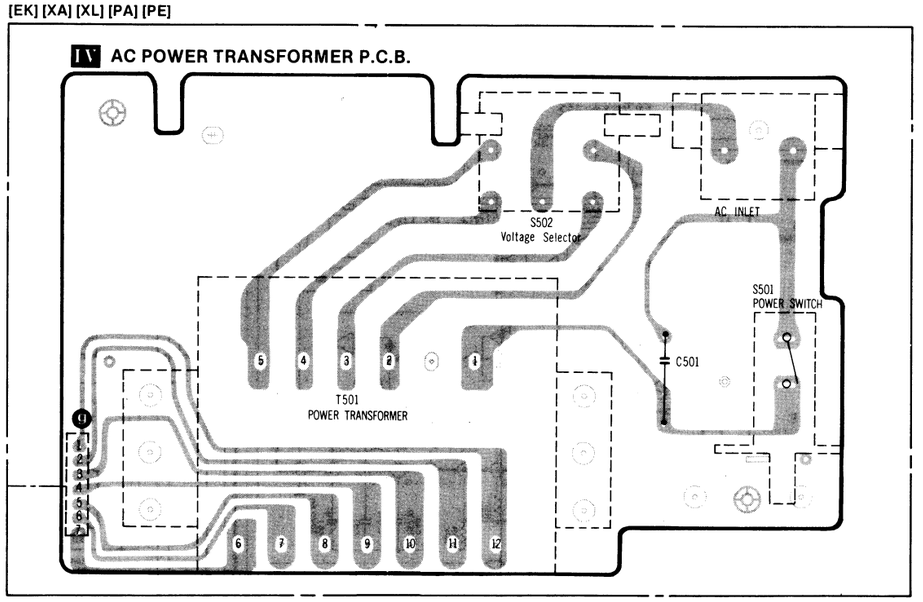
[E] [EH] [EGA]

IV AC POWER TRANSFORMER P.C.B.

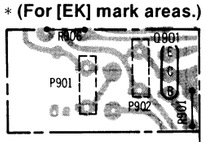


[EK] [XA] [XL] [PA] [PE]

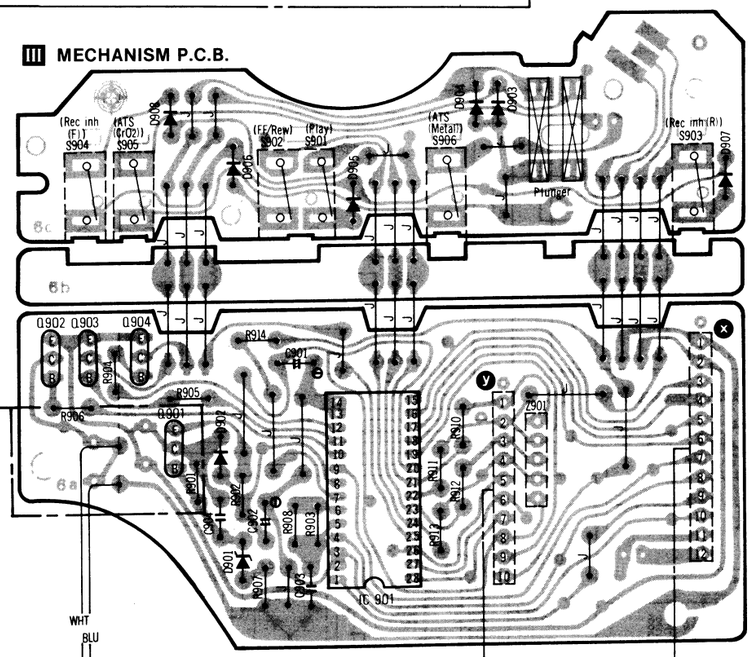
IV AC POWER TRANSFORMER P.C.B.



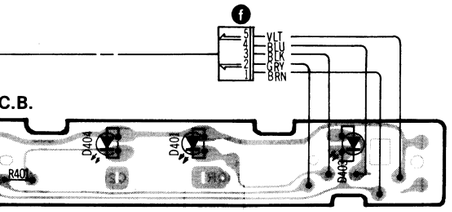
* (For [EK] mark areas.)



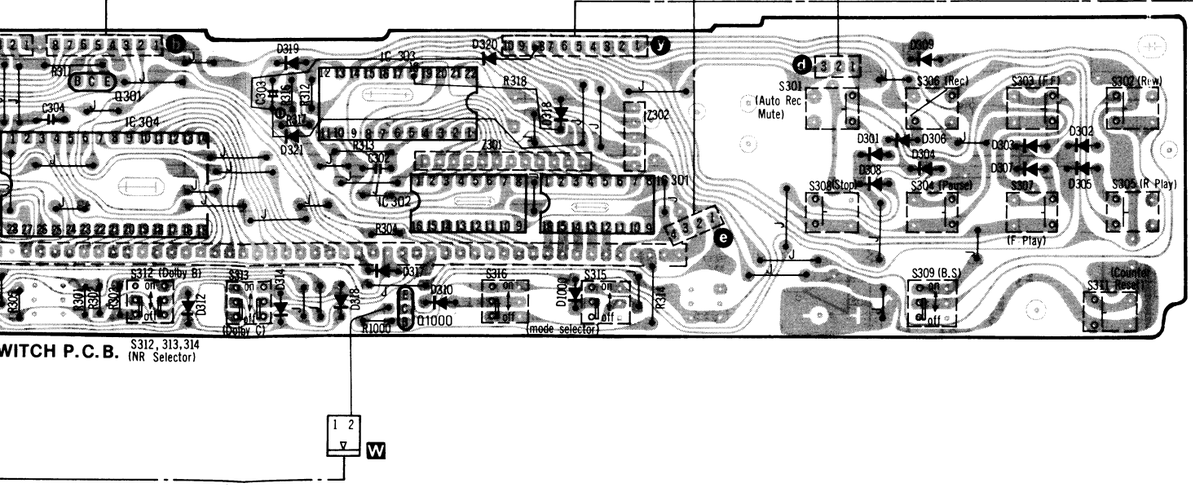
III MECHANISM P.C.B.



C.B.

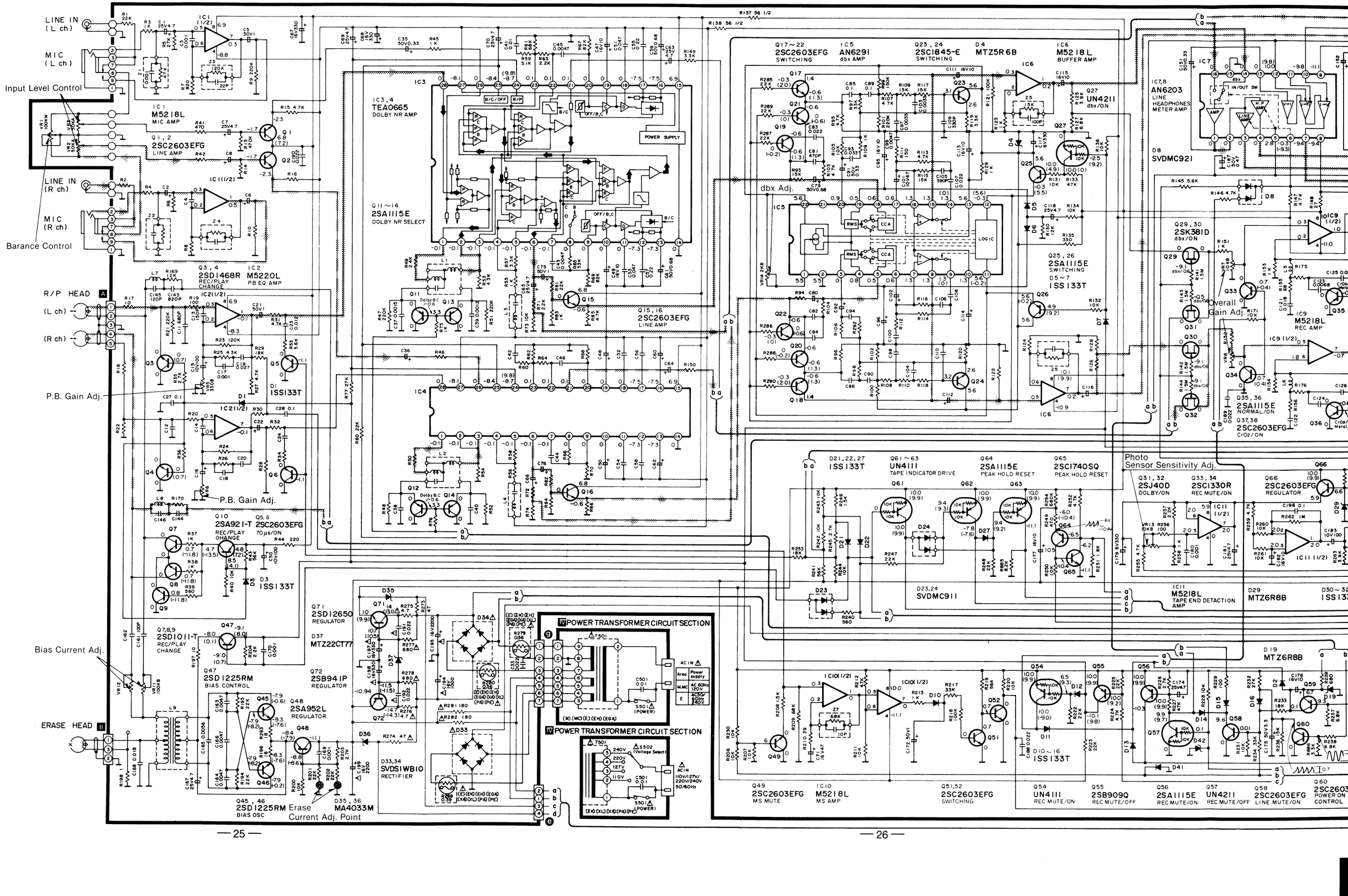


WITCH P.C.B. S312, 313, 314 (NR Selector)



■ SCHEMATIC DIAGRAM

I MAIN CIRCUIT SECTION



10 11 12 13 14 15 16 17 18 19

FL Meter Adj. (-40dB)

VR9 2K B

IC7,8
AN6203
LINE
HEADPHONES
METER AMP

D8
SVDMC921

LINE OUT L ch

LINE OUT R ch

HEADPHONES

II FL METER/SWITCH CIRCUIT SECTION

FL Meter Adj. (0dB)

VR10 20KB

IC9 (1/2)

IC9
M5218L
REC AMP

Overall Gain Adj.

Q29,30
2SK381D
dbx/ON

Q31,32
2SJ40D
DOLBY/ON

Q33,34
2SC1330R
REC MUTE/ON

Q35,36
2SA1115E
NORMAL/ON

Q37,38
2SC2603EFG
CrO2/ON

Q43
2SC2603EFG
METAL/ON

D39
1S2473

Photo Sensor Sensitivity Adj.

Q66
2SC2603EFG
REGULATOR

Q67,68
2SC2603EFG
SWITCHING

Q39,40
2SC2603EFG
CrO2/ON

Q41,42
2SC2603EFG
METAL/ON

S1 TIMER
PLAY — OFF — REC

D28
1SS133T

IC11 (1/2)

IC11
M5218L
TAPE END DETACTION AMP

D29
MTZ6R8B

D30~32
1SS133T

D19
MTZ6R8B

D40,41
1SS133T

D43
MTZ22CT77

V LED CIRCUIT SECTION

D405
1SS133T

D401~403
SLV31MC3

D404
SLV31VC3

Q70
UN4111
LED DRIVE

Q56
2SA1115E
REC MUTE/ON

Q57
UN4211
REC MUTE/OFF

Q58
2SC2603EFG
LINE MUTE/ON

Q60
2SC2603EFG
POWER ON MUTE CONTROL

Q59
2SA1115E
LINE MUTE CONTROL

III MECHANISM CONTROL CIRCUIT SECTION

PHONO SENSOR (TAPE ENDDET)

D901
MA4056M

IC901
LN6413E1826
MECHANISM CONTROL

Q901
2SD592A
REGULATOR

D902
ICP902 (EK)only

Q902
2SB621A-R
MOTOR DRIVE

Q903,904
2SB1030
PLUNGER DRIVE

IC902
DN6838
HALL-IC

D902~908
1SS133T

S905 CrO2 (A.T.S)

S906 Metal (A.T.S)

S901 Play mode D905

S902 FF/Rew mode D906

S903 Rec inh(R) D907

S904 Rec inh.(F) D908

IC304
AN6870N
METER DRIVE

D316

Q301
2SC2603EFG
METER MUTE

D316,317
1SS133T

FL METER

(Dolby NR/dbx Selector)

S312-1 Dolby-B
S313-1 Dolby-C
S314-1 dbx

S312-2 Dolby-B
S313-2 Dolby-C
S314-2 dbx

S311 Counter Reset

D312~315
1SS133T

D319
1SS133T

D320,321
MTZ22CT77

IC303
LM6417E589
COUNTER CONTROL

MICRO COMPUTOR

S301 Rec Mute D301
S302 Rew D302
S303 FF D303
S304 Pause D304
S305 R.Play D305
S306 Rec D306
S307 F.Play D307
S308 Stop D308
S309 (Bronk Skip) D309

D301~310
1SS133T

(Reverse mode Selector)
S315-2 S315-1 S316

IC301,302
AN6280
COUNTER DRIVE

Q1000
2SC2603EFG

NOTES:
(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the parts No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.
* This is the basic circuit diagram of this unit. Note that part of the circuit is subject to change depending on the areas.

- **S1** : Timer switch in "**OFF**" position.
- **S301** : Auto Rec mute switch in "**OFF**" position.
- **S302** : Rewind switch in "**OFF**" position.
- **S303** : Fast forward switch in "**OFF**" position.
- **S304** : Pause switch in "**OFF**" position.
- **S305** : Revers play switch in "**OFF**" position.
- **S306** : Record switch in "**OFF**" position.
- **S307** : Forward play switch in "**OFF**" position.
- **S308** : Stop switch in "**OFF**" position.
- **S309** : Blank skip switch in "**OFF**" position. (■ off, ▬ on)
- **S311** : Counter reset switch in "**OFF**" position.
- **S312∿S314** : Noise-reduction select switch in "**OUT**" position. (S312 ▬: Dolby B, S313 ▬: Dolby C, S314 ▬: dbx, S312, S313, S314 ■: OUT)
- **S315, S316** : Mode select switch in "⇄" position. (S315 ▬: " ⟲ ", S316 ▬: " ⟲ ", S315, S316 ■: "⇄")
- **S501** : Power switch in "**ON**" position.
- **S502** [EK][XA][XL][PA][PE] : Voltage select swich in "**240V**" position. (110V ⟷ 127V ⟷ 220V ⟷ 240V)
- **S901** : Play mode switch in "**OFF**" position.
- **S902** : FF/REW mode switch in "**OFF**" position.
- **S903** : Rec inhibit (Revers) switch in "**OFF**" position.
- **S904** : Rec inhibit (Forward) switch in "**OFF**" position.
- **S905** : Auto tape selector switch (for CrO_2 tape).
- **S906** : Auto tape selector switch (for metal tape).
- **VR1** : Balance control.
- **VR2, 3** : Input level control.
- **VR5, 6** : Playback level adjustment VR.
- **VR7, 8** : Overall gain adjustment VR.
- **VR9** : FL meter adjustment VR (−40dB indication).
- **VR10** : FL meter adjustment VR (0dB indication).
- **VR11, 12** : Bias current adjustment VR.
- **VR13** : Photo senser sensitivity adjustment VR.
- **VR14** : Attack recoverly time adjustment VR.
- **L1, 2** : MPX coil.
- **L3, 4** : Skewing network coil.
- **L5, 6** : Peaking coil.
- **L7, 8** : Bias trap coil.
- **L9** : Bias oscillation coil.

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000(Ω), 1M = 1,000k(Ω)
- Capacity are in micro-fards (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ) .....Voltage values at record mode.
  CrO_2.....Voltage values at CrO_2 tape mode.
  Metal .....Voltage values at Metal tape mode.
  Stop.....Voltage values at Stop mode.
  NR IN .....Voltage value at which the noise reduction switch is turned on.
  For measurement use EVM.
- (———) indicates B (bias).
- (▒▒▒) indicates the flow of the playback signal.
- (▒▒▒) indicates the flow of the recording signal.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

* Caution!

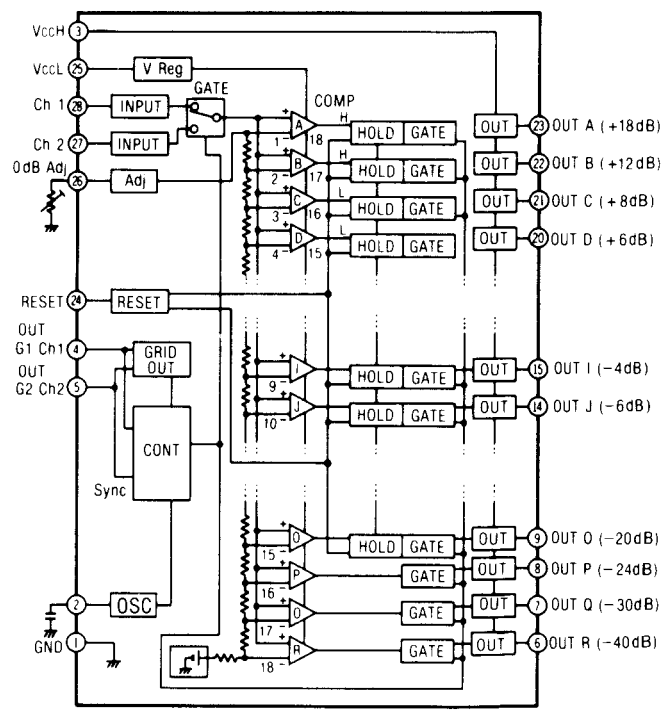
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
* Cover the parts boxes made of plastics with aluminum foil.
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with the fingers directly.

SPECIFICATIONS

* Input level control...MAX
* Balance control.....Center

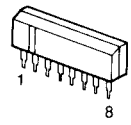
Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO_2 ...QZZCRZ for Metal	Normal Less than 2.1% CrO_2 Metal Less than 2.8%
Overall S/N ratio * Test tape...QZZCRX	Greater than 45dB (without NAB filter)

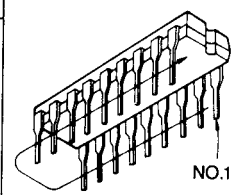
EQUIVALENT CIRCUIT
IC304: AN6870N



■ TERMINAL GUIDE OF TRANSISTORS DIODES, AND IC'S

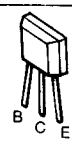
M5218L, M5220L



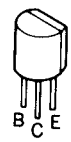


AN6203	11 Pin
AN6280	
LM6417E589	22 Pin
AN6291	
AN6870N	28 Pin
TEA0665	
LM6413E1826	

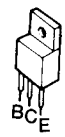
2SA1115E, UN4211, UN4111, 2SA921Q, 2SD592A, 2SC2603EFG, 2SD1011-T, 2SB1030R



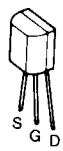
2SD1468R, 2SB621A-R



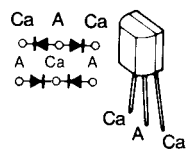
2SB941Q, 2SD12650



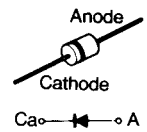
2SK381D, 2SJ40D



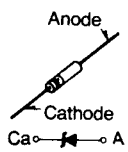
SVDMC911, SVDMC921



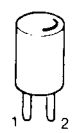
SM112, 1SS133T



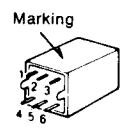
MTZ5R1B, MTZ6R8B, MTZ22BT77, MA4033M



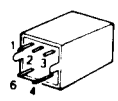
QLQX0343KWA

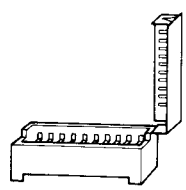


QLB0202K



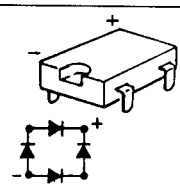
ELM7Q306A, QLM9Z10K

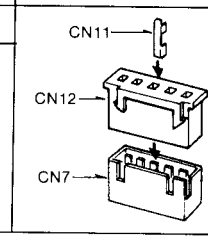


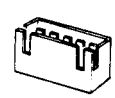


CN3	QJS1997S	3 Pin
CN6	QJS1987S	4 Pin
CN4	QJS1962S	5 Pin
CN5	QJS1983S	8 Pin
CN8	QJS1989S	10 Pin
CN9	QJS1990S	12 Pin

SVDS1WB10

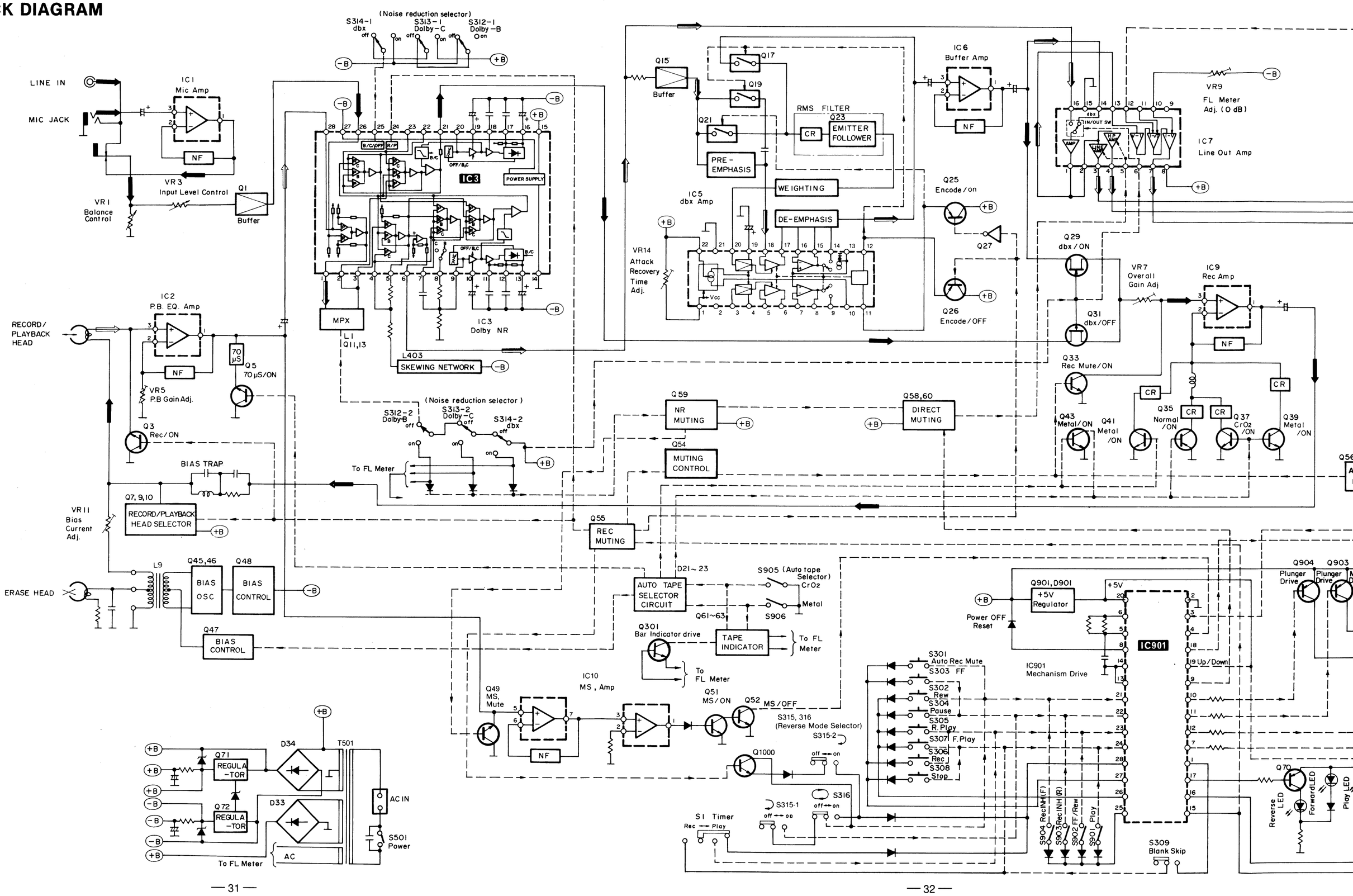


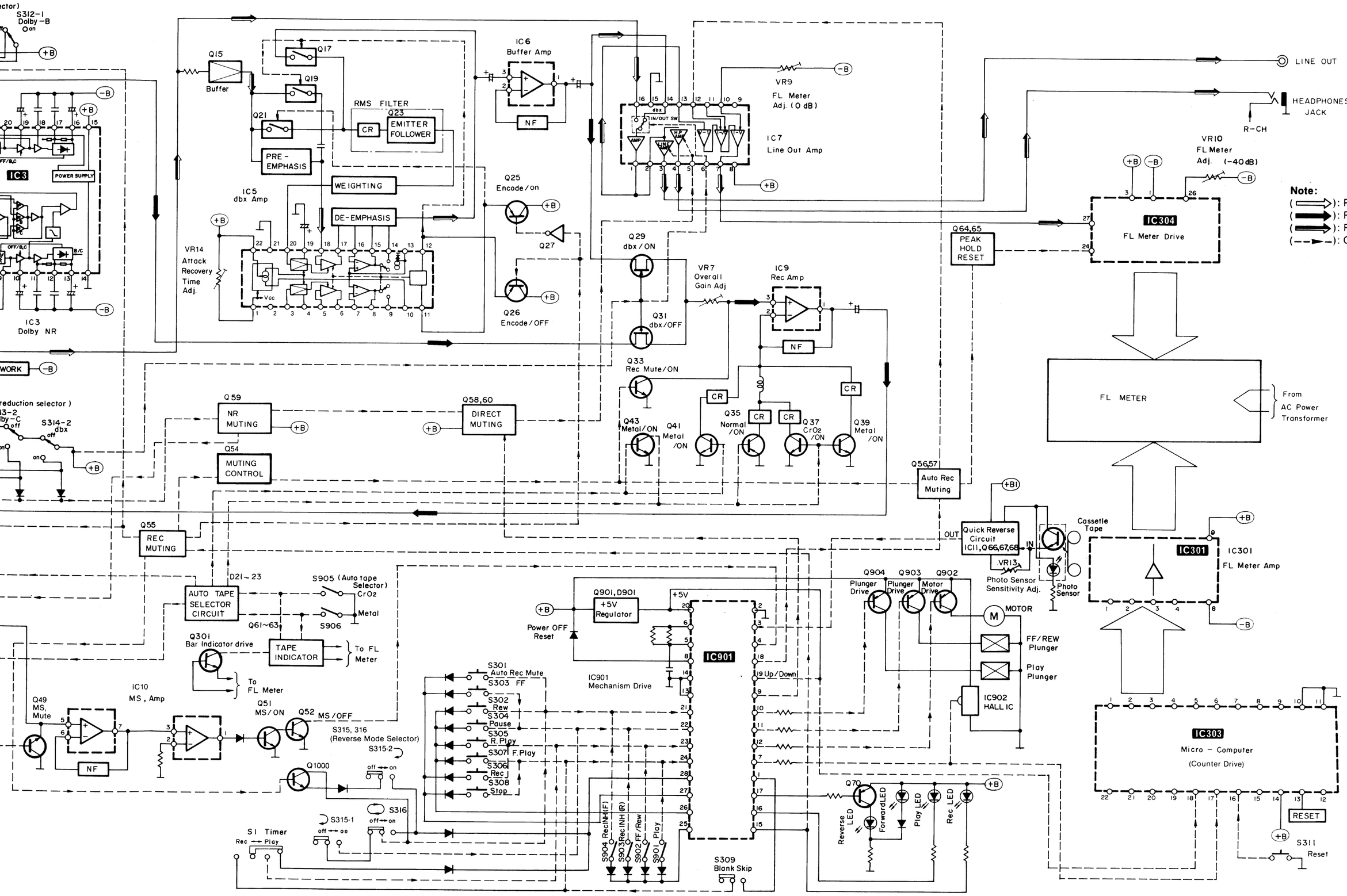




CN1	B3B-PH	3 Pin
CN2	B5B-PH	5 Pin

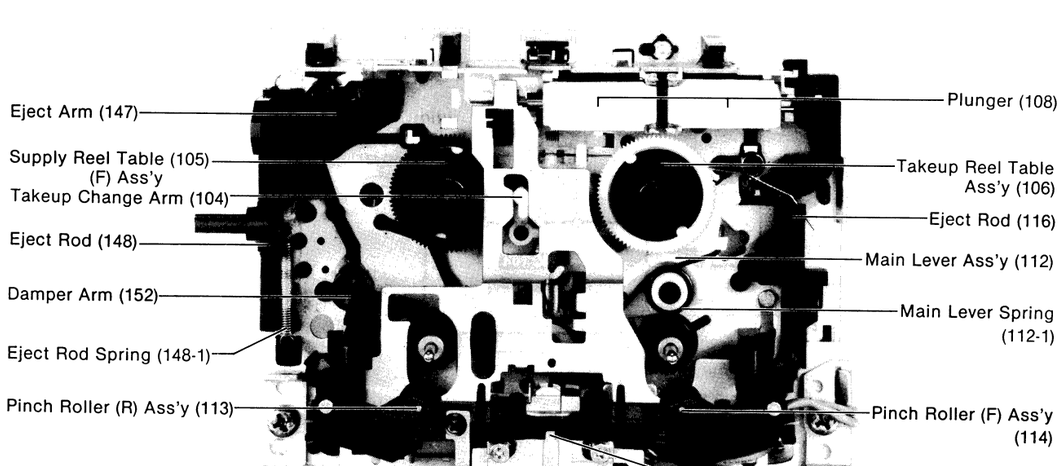
■ BLOCK DIAGRAM

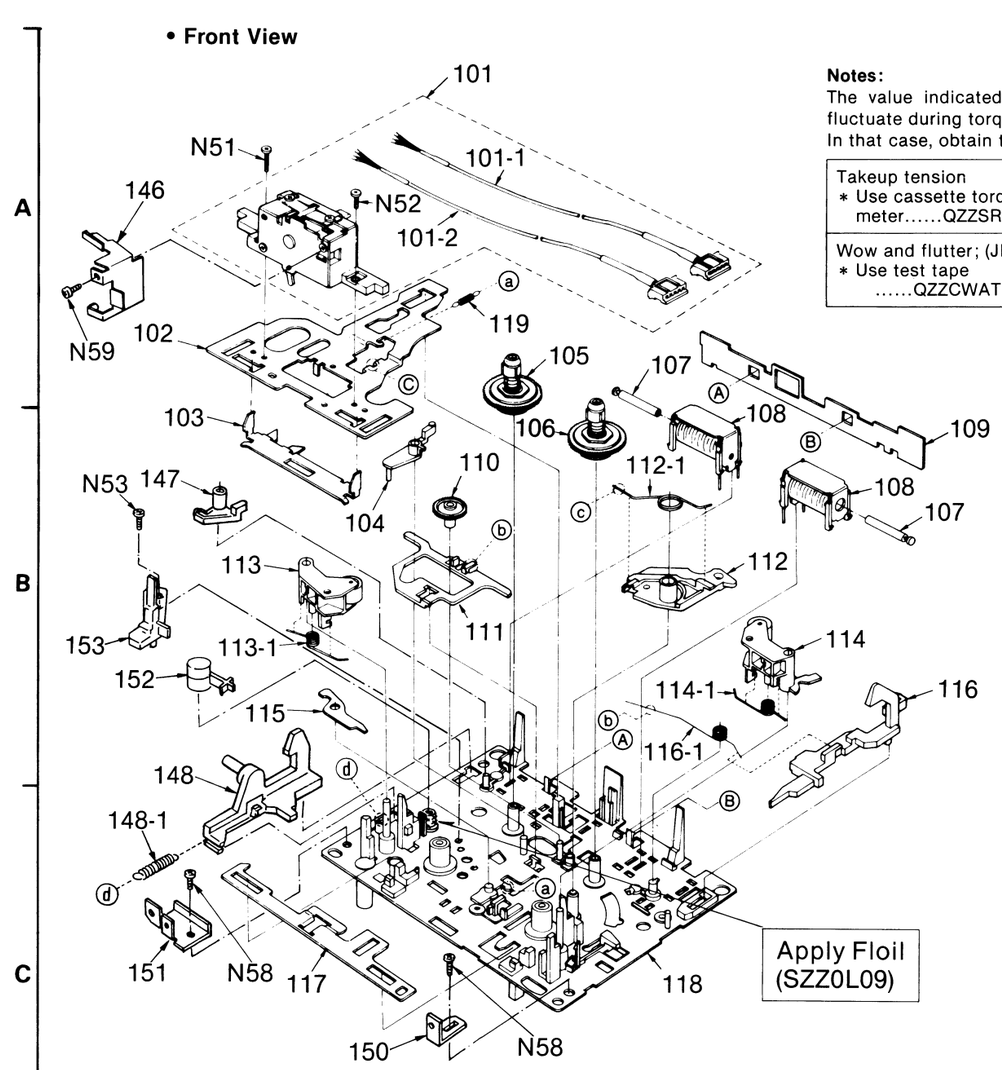



S312-1
Dolby-B
on
+B
-B
IC3
POWER SUPPLY
IC3
Dolby NR
WORK
reduction selector)
S313-2
Dolby-C
off
on
S314-2
dbx
off
on
Q15
Buffer
Q17
Q19
Q21
RMS FILTER
Q23
CR
EMITTER FOLLOWER
PRE-EMPHASIS
WEIGHTING
DE-EMPHASIS
IC5
dbx Amp
VR14
Attack Recovery Time Adj.
Vcc
IC6
Buffer Amp
NF
Q25
Encode/on
Q27
Q26
Encode/OFF
IC7
Line Out Amp
VR9
FL Meter Adj. (0 dB)
dbx
IN/OUT SW
HP LINE
LINE AMP
LINE OUT
HEADPHONES JACK
R-CH
VR10
FL Meter Adj. (-40dB)
IC304
FL Meter Drive
Q64,65
PEAK HOLD RESET
Note:
(⟹): Playback Signal
(➡): Record Signal
(⟹): Record/Playback Signal
(- - ►-): Control Signal
Q29
dbx/ON
Q31
dbx/OFF
VR7
Overall Gain Adj
IC9
Rec Amp
Q33
Rec Mute/ON
Q43
Metal/ON
Q41
Metal /ON
CR
Q35
Normal /ON
Q37
CrO2 /ON
Q39
Metal /ON
Q59
NR MUTING
Q58,60
DIRECT MUTING
Q54
MUTING CONTROL
Q55
REC MUTING
Q56,57
Auto Rec Muting
FL METER
From AC Power Transformer
+B1
OUT
Quick Reverse Circuit
IC11,Q66,67,68
IN
VR13
Photo Sensor Sensitivity Adj.
Photo Sensor
Cassette Tape
IC301
FL Meter Amp
D21~23
AUTO TAPE SELECTOR CIRCUIT
S905 (Auto tape Selector)
CrO2
Metal
S906
Q61~63
Q301
Bar Indicator drive
TAPE INDICATOR
To FL Meter
To FL Meter
Q901,D901
+5V Regulator
+5V
Power OFF Reset
IC901
IC901 Mechanism Drive
Q904
Plunger Drive
Q903
Plunger Drive
Q902
Motor Drive
M
MOTOR
FF/REW Plunger
Play Plunger
IC902
HALL IC
IC303
Micro - Computer
(Counter Drive)
RESET
S311
Reset
IC10
MS , Amp
Q49
MS, Mute
Q51
MS/ON
Q52
MS/OFF
NF
S315, 316
(Reverse Mode Selector)
S315-2
S316
S315-1
S1 Timer
Rec
Play
Q1000
S301
Auto Rec Mute
S303 FF
S302
Rew
S304
Pause
S305
R.Play
S307 F.Play
S306
Rec
S308
Stop
S904 Rec(F)
S903 Rec INH (R)
S902 FF/Rew
S901 Play
S309
Blank Skip
Q70
Reverse LED
Forward LED
Play LED
Rec LED

RS-B49R RS-B49R

■ MECHANICAL PARTS LOCATION





Notes:
The value indicated by the torque tape may fluctuate during torque measurement.
In that case, obtain the middle of the values.

Takeup tension * Use cassette torque meter.....QZZSRKCT	40^{+20}_{-12} g-cm
Wow and flutter; (JIS) * Use test tape .....QZZCWAT	Less than 0.15% (WRMS)

| | | |

-Plunger (108)

up Reel Table Ass'y (106)

Eject Rod (116)

ver Ass'y (112)

h Lever Spring (112-1)

oller (F) Ass'y (114)

d Block Ass'y (101)

ey Ass'y (137)

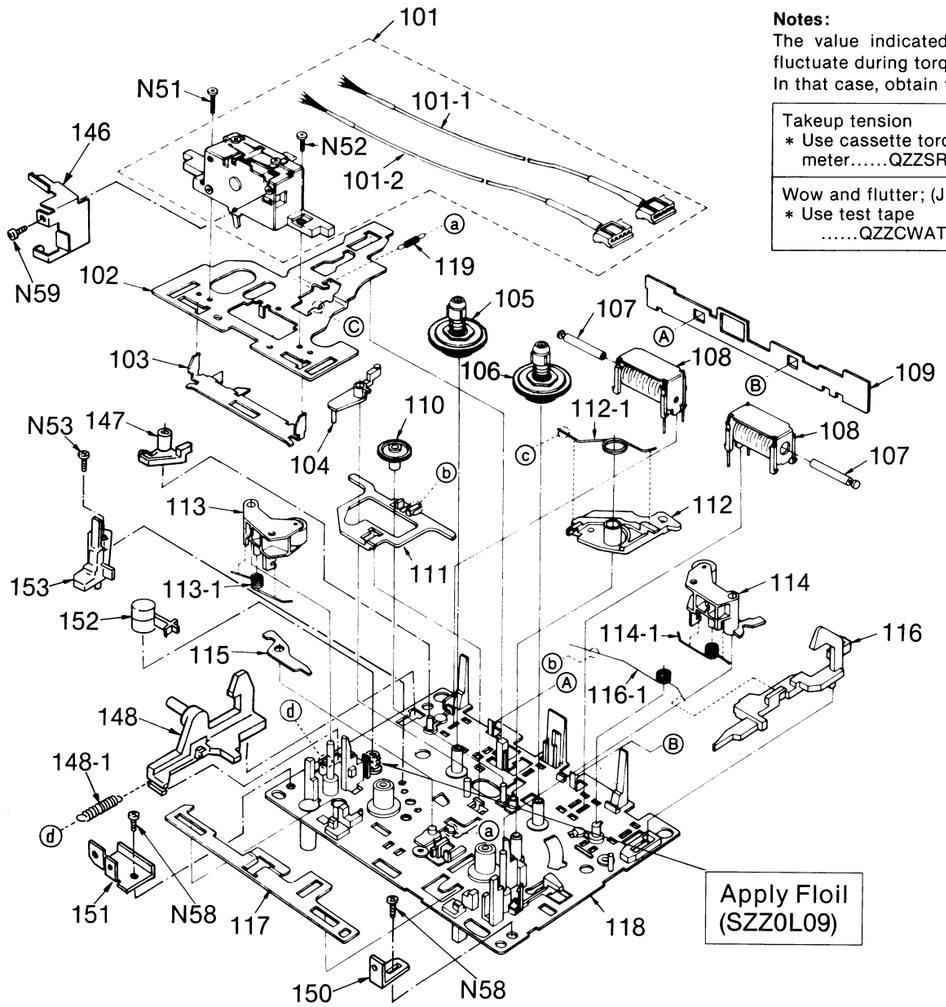
-FF Belt (138)

el Table Gear (135)

lain Belt (127)

or Ass'y (120)

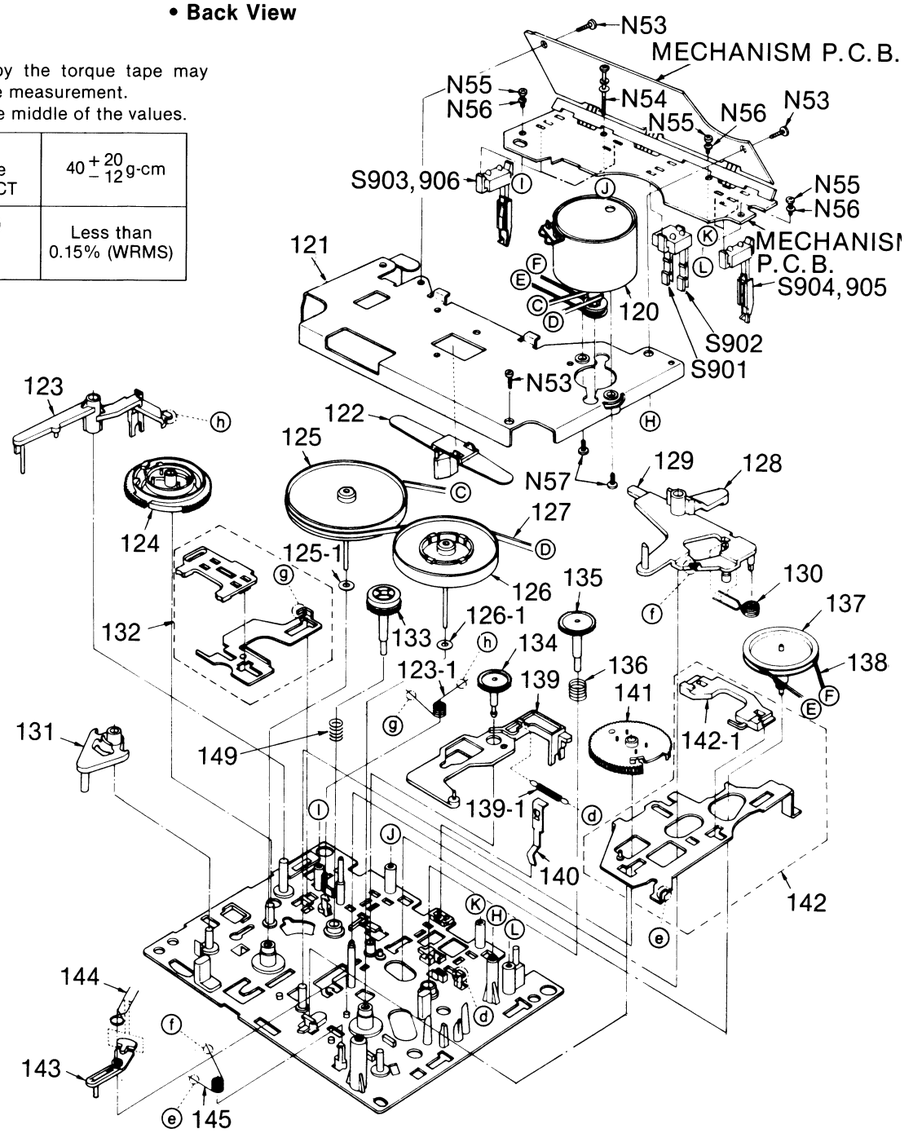
• Front View



Notes:
The value indicated by the torque tape may fluctuate during torque measurement.
In that case, obtain the middle of the values.

Takeup tension * Use cassette torque meter.....QZZSRKCT	40^{+20}_{-12} g-cm
Wow and flutter; (JIS) * Use test tape .....QZZCWAT	Less than 0.15% (WRMS)

• Back View



| | | |

■ TECHNICAL GUIDE

- **Description of mechanism operation**

Employed for this unit is the newly developed record/playback auto reverse mechanism.
The conventional record/playback auto reverse mechanism (RS-8R series) used two motors (for capstan drive and head up/down operation), while this newly developed mechanism usess only one motor for capstan and head up/down operation.
The basic operations (FWD STOP → FWD, FWD → REV) of this mechanism are explained in the following.

1) FWD STOP → FWD PLAY OPERATION

❶ Press FWD button.

❷ PLAY plunger is driven instantaneously (300msec).

❷′ Motor rotates.

❸ Main control lever turns clockwise to unlock the main gear, slightly turning it counterclockwise.

❹ Main gear is engaged with the forward rotation flywheel gear and rotates counterclockwise.

❺ Main lever turns counterclockwise according to the groove shape of main gear.

❺′ FR rod is shifted down by the cam of main gear.

* REV STOP
FR change arm is turned clockwise by FR rod, moving the FR change rod to the left.

❻ Head base board is pushed up by the main lever spring.

❼ Winding change lever turns clockwise according to the shape of pinch roller change rod.

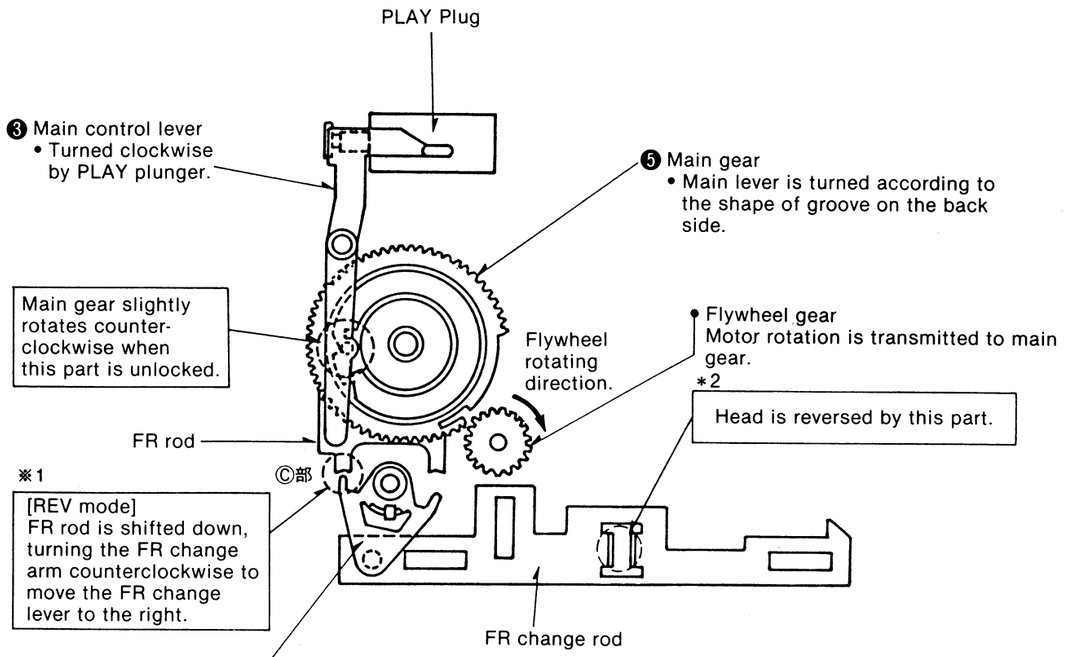
❼′ Forward rotation pinch roller is pushed up by pinch roller change rod.

❼″ Brake rod is pushed up to unlock the reel base.

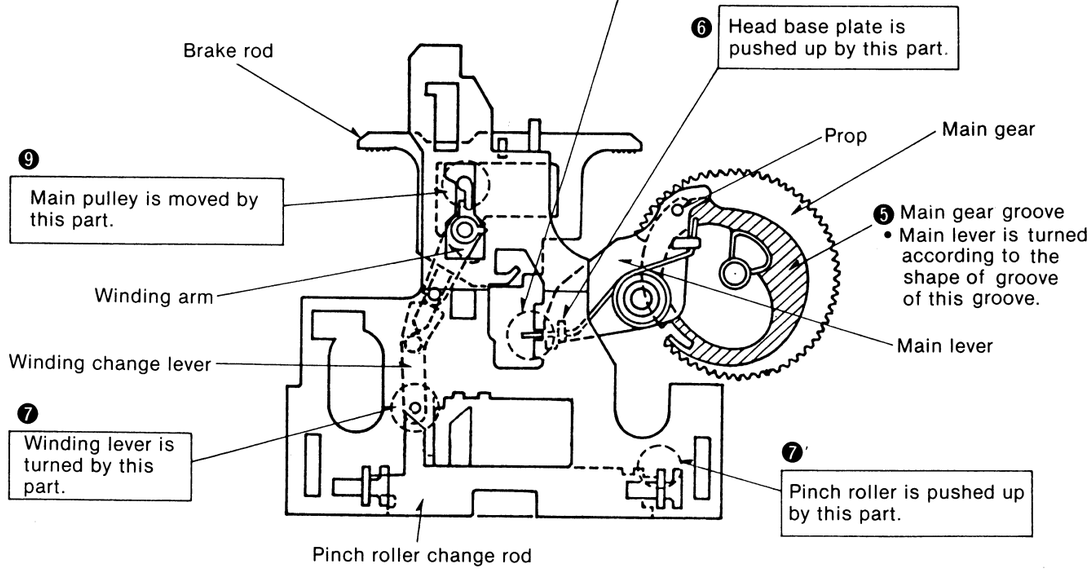
❽ Winding arm is turned counterclockwise by winding change lever.

❾ Main pulley pinion is engaged with forward rotation reel base.

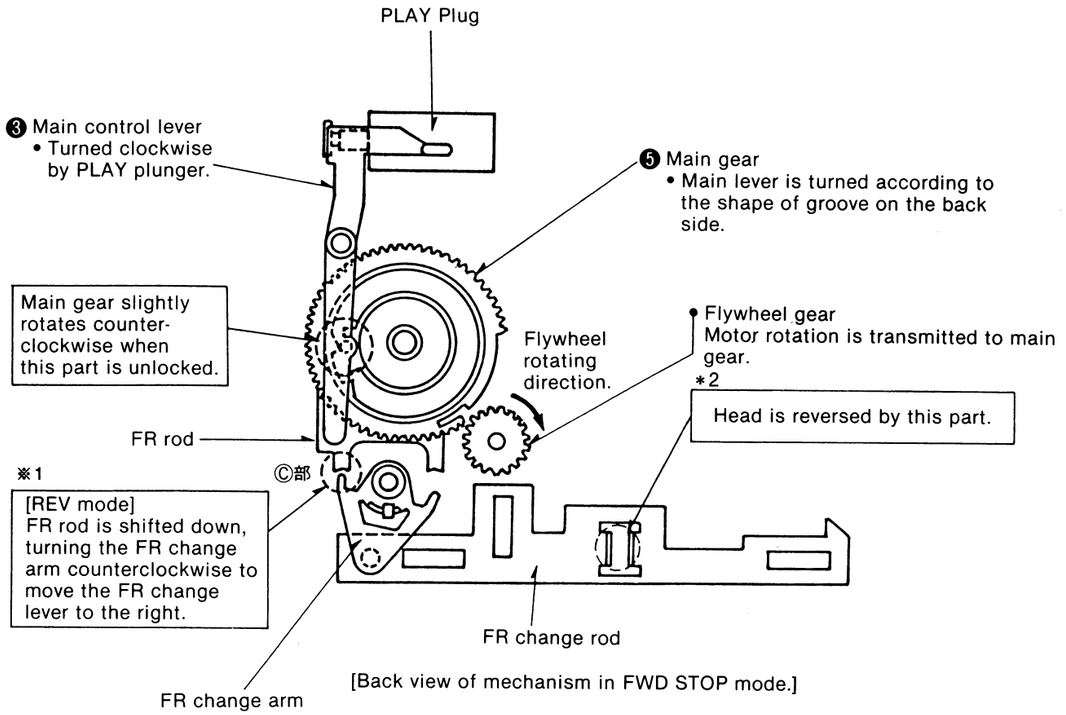
FWD operation.


PLAY Plug
❸ Main control lever
• Turned clockwise by PLAY plunger.
❺ Main gear
• Main lever is turned according to the shape of groove on the back side.
Main gear slightly rotates counter-clockwise when this part is unlocked.
Flywheel rotating direction.
• Flywheel gear
Motor rotation is transmitted to main gear.
*2
Head is reversed by this part.
FR rod
※1
©部
[REV mode]
FR rod is shifted down, turning the FR change arm counterclockwise to move the FR change lever to the right.
FR change rod
FR change arm

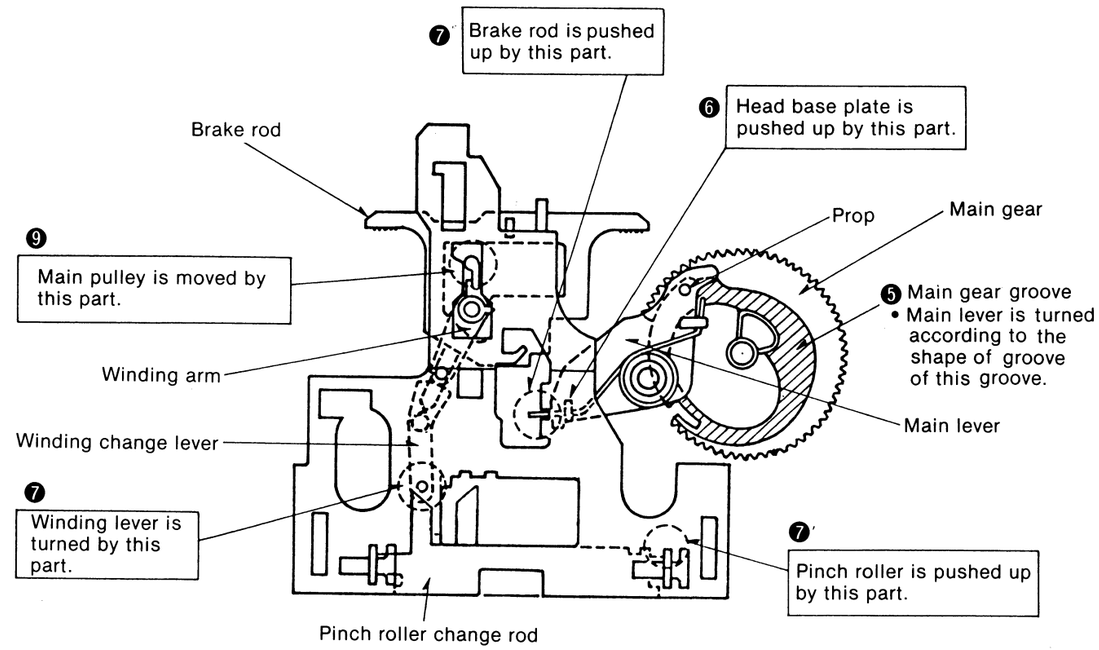
[Back view of mechanism in FWD STOP mode.]


❼′ Brake rod is pushed up by this part.
❻ Head base plate is pushed up by this part.
Brake rod
Prop
Main gear
❾
Main pulley is moved by this part.
❺ Main gear groove
• Main lever is turned according to the shape of groove of this groove.
Winding arm
Main lever
Winding change lever
❼
Winding lever is turned by this part.
❼′
Pinch roller is pushed up by this part.
Pinch roller change rod

[Front view of mechanism in FWD STOP mode.]


PLAY Plug
❸ Main control lever
• Turned clockwise by PLAY plunger.
❺ Main gear
• Main lever is turned according to the shape of groove on the back side.
Main gear slightly rotates counter-clockwise when this part is unlocked.
Flywheel rotating direction.
• Flywheel gear
Motor rotation is transmitted to main gear.
*2
Head is reversed by this part.
FR rod
※1
©部
[REV mode]
FR rod is shifted down, turning the FR change arm counterclockwise to move the FR change lever to the right.
FR change rod
FR change arm

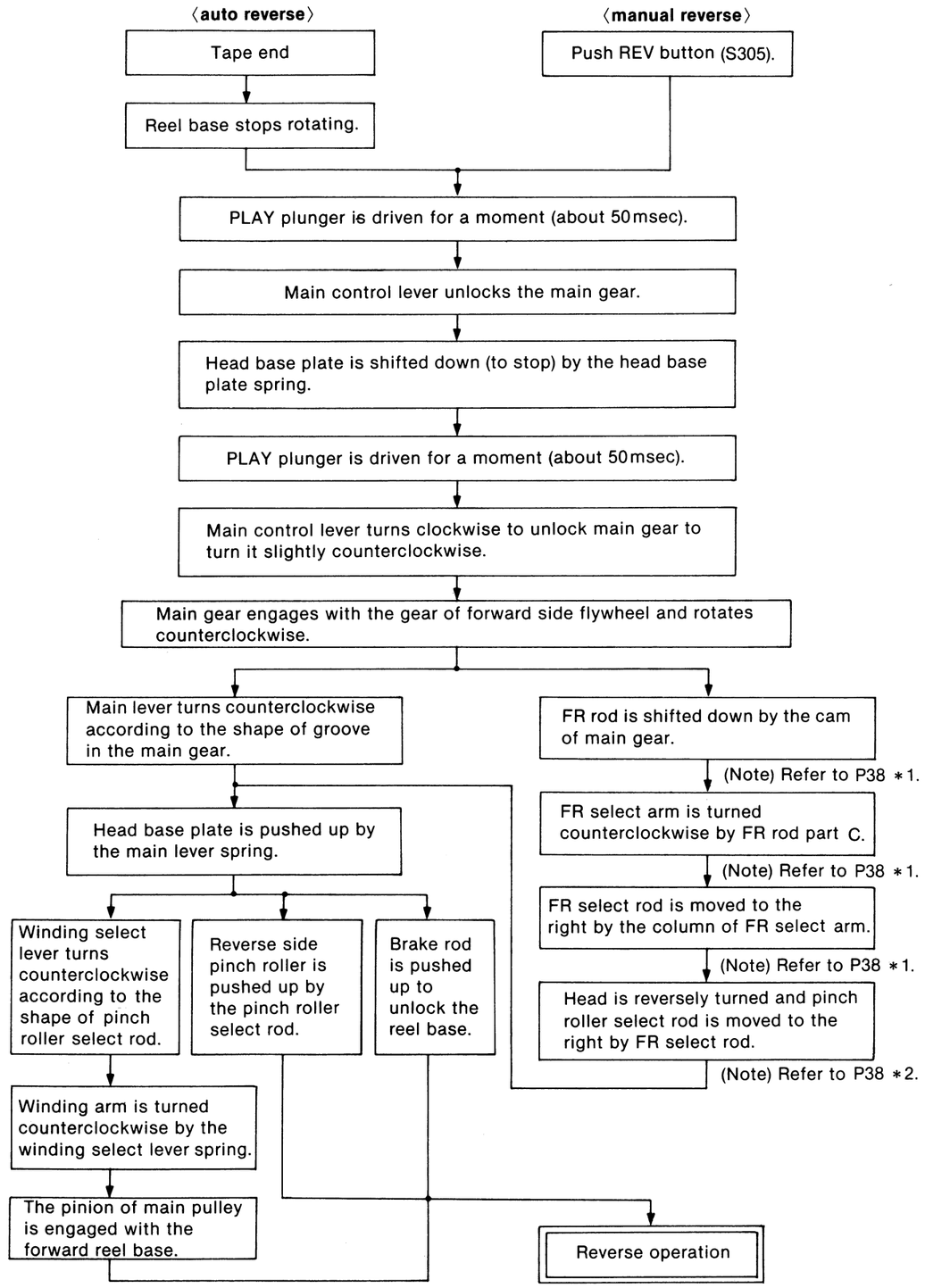
[Back view of mechanism in FWD STOP mode.]


❼ Brake rod is pushed up by this part.
❻ Head base plate is pushed up by this part.
Brake rod
Prop
Main gear
❾
Main pulley is moved by this part.
❺ Main gear groove
• Main lever is turned according to the shape of groove of this groove.
Winding arm
Main lever
Winding change lever
❼
Winding lever is turned by this part.
❼'
Pinch roller is pushed up by this part.
Pinch roller change rod

[Front view of mechanism in FWD STOP mode.]

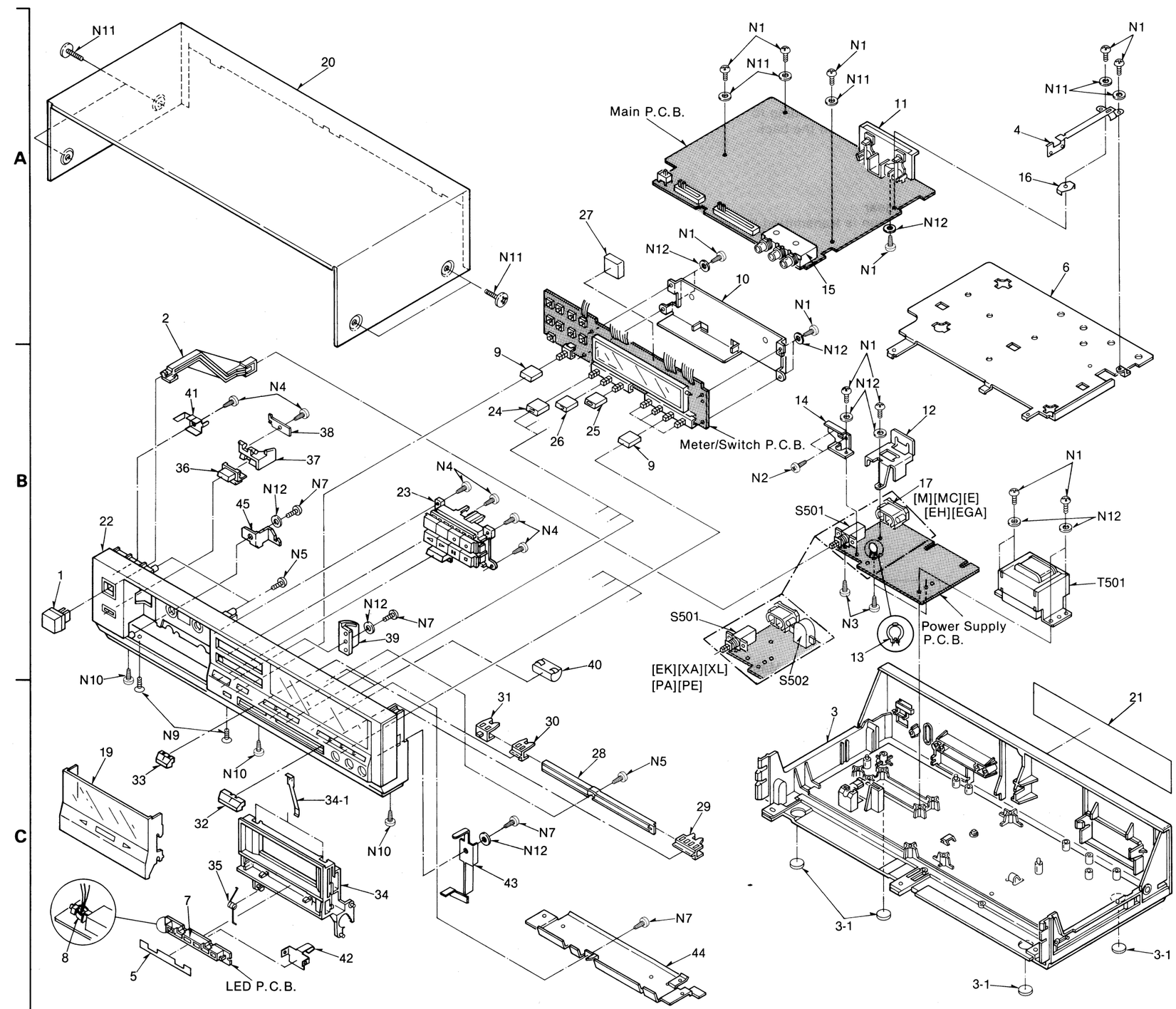
2) REVERSE OPERATION (FWD → REV)

◎ For the mechanism illustration, refer to P38.


〈auto reverse〉
Tape end
Reel base stops rotating.
〈manual reverse〉
Push REV button (S305).
PLAY plunger is driven for a moment (about 50msec).
Main control lever unlocks the main gear.
Head base plate is shifted down (to stop) by the head base plate spring.
PLAY plunger is driven for a moment (about 50msec).
Main control lever turns clockwise to unlock main gear to turn it slightly counterclockwise.
Main gear engages with the gear of forward side flywheel and rotates counterclockwise.
Main lever turns counterclockwise according to the shape of groove in the main gear.
Head base plate is pushed up by the main lever spring.
Winding select lever turns counterclockwise according to the shape of pinch roller select rod.
Reverse side pinch roller is pushed up by the pinch roller select rod.
Brake rod is pushed up to unlock the reel base.
Winding arm is turned counterclockwise by the winding select lever spring.
The pinion of main pulley is engaged with the forward reel base.
FR rod is shifted down by the cam of main gear.
(Note) Refer to P38 *1.
FR select arm is turned counterclockwise by FR rod part C.
(Note) Refer to P38 *1.
FR select rod is moved to the right by the column of FR select arm.
(Note) Refer to P38 *1.
Head is reversely turned and pinch roller select rod is moved to the right by FR select rod.
(Note) Refer to P38 *2.
Reverse operation

RS-B49R RS-B49R

■ CABINET PARTS LOCATION



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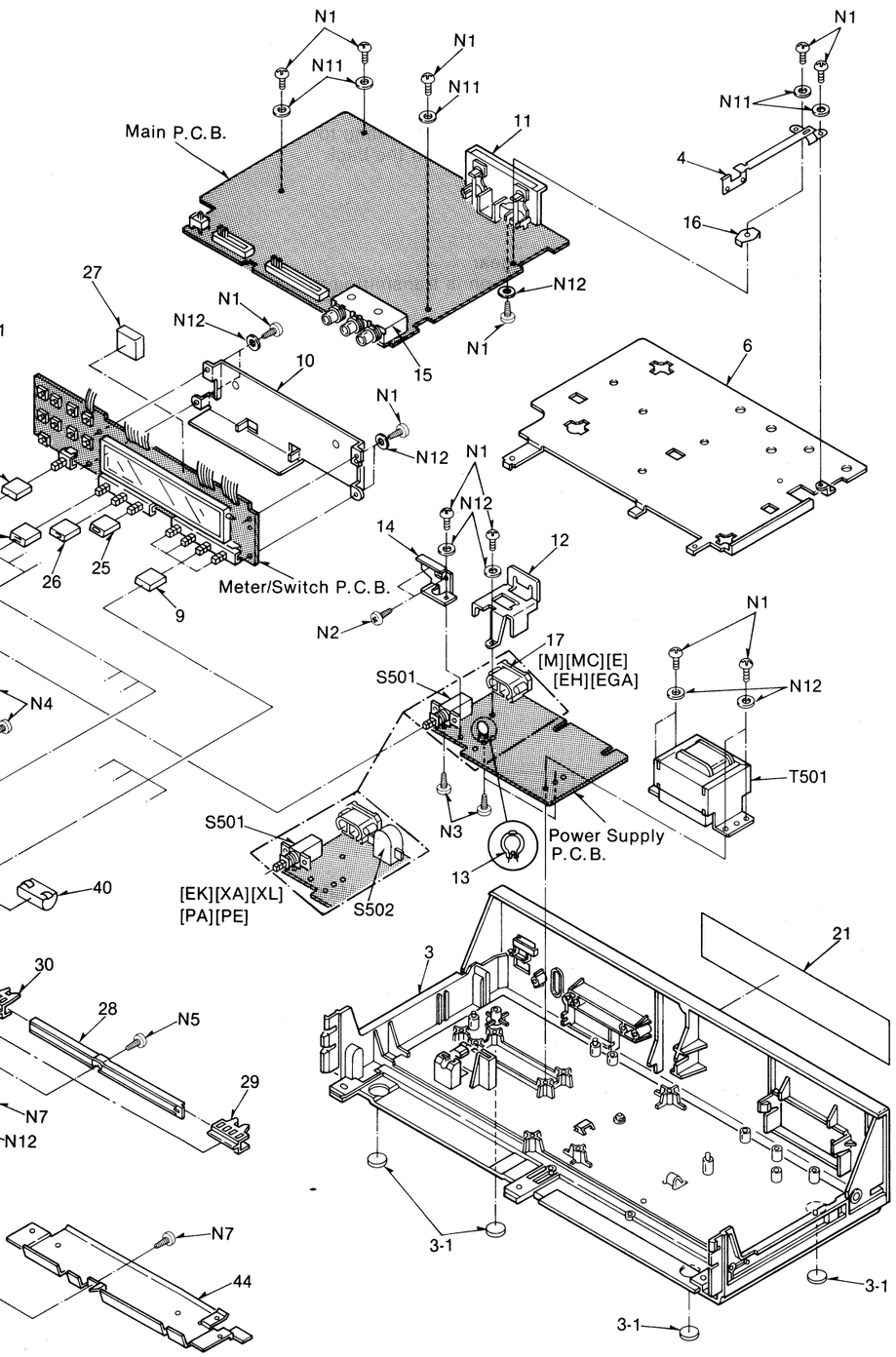


				27		10	15	11		6 16	4
	40	9	24 26	25	9			14	13	17 12	
30	28	44		29		3-1		3	3-1	21	3-1

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Areas

- * [M] U.S.A.
- * [MC] Canada.
- * [E] All European areas except United Kingdom.
- * [EK] United Kingdom.
- * [EH] Holland.
- * [EGA] F.R. Germany.
- * [PA] Far East PX.
- * [PE] European Military.
- * [XA] Asia, Latin America, Middle East and Africa.
- * [XL] Australia.

CABINET PARTS

Ref. No.	Part No.	Part Name & Description
1	SBC666	Power Button
2	SUB237	Power Rod
3 [M][MC][E][EH][EGA]	SKMSB25-SE	Main Case Ass'y
3 [EK][PA][PE][XA][XL]	SKMSB25-SKE	Main Case Ass'y
3-1	QKA1094	Case Foot
4	SUS795	Erath Plate
5	SHRM5	Sheet
6	SMC6377	Shield Plate
7	SMPM4	Reflection Plate
8	QTD1333	Cord Clamper
9	SBC735	Push Button
10	SMN1968	Strengthen Angle (B)
11	QEJ5039C	Jack Board
12	SMN1965	Holder Angle
13	SMX888	Spark Killer Cover
14	SMN1974	Power Switch Angle
15	SMN1970-2	Microphone Angle
16	SNE55-1	Earth Plate
17 ⚠	SJS9230	AC Inlet
17 [XL] ⚠	SJS9235	AC Inlet
19 [M][MC]	SYKM10 "Silver Type"	Cassette Lid Ass'y
19 [E][EK][EH][EGA][PA][PE][XA][XL]	SYKM10-2 "Black Type"	Cassette Lid Ass'y
19 [E][EK][EH][EGA][PA][PE][XA][XL]	SYKM10-1 "Silver Type"	Cassette Lid Ass'y
20	SKC1782K99-1 "Black Type"	Case Cover
20	SKC1782S98-1 "Silver Type"	Case Cover
21 [M]	SGTM18	Main Name Plate
21 [MC]	SGTM23	Main Name Plate
21 [E]	SGTM26	Main Name Plate
21 [EK]	SGTM25	Main Name Plate
21 [EH][EGA]	SGTM37	Main Name Plate
21 [PA][PE][XA]	SGTM43	Main Name Plate
21 [XL]	SGTM44	Main Name Plate
22 [M][MC]	SGYSB49R-SM "Silver Type"	Front Panel Ass'y
22 [E][EK][EH][EGA][PA][PE][XA][XL]	SGYSB49R-KE "Black Type"	Front Panel Ass'y
22 [E][EK][EH][EGA][PA][PE][XA][XL]	SGYSB49R-SE "Silver Type"	Front Panel Ass'y
23	SYWM9	Operation Chassis Ass'y
24	SBC735-2	Reverse Button (A)
25	SBC735-6	Reverse Button (C)
26	SBC735-4	Reverse Button (B)
27	SHGM1	Rubber Cushion
28	SGX7756-1 "Black Type"	Slide Guide
28	SGX7756 "Silver Type"	Slide Guide
29	SGX7757	Slider (A)
30	SGX7758	Slider (B)
31	SBD121	Timer Knob
32	SBD122	Volume Knob (A)
33	SBD123	Volume Knob (B)
34	SGXSB25-SE1	Cassette Holder Ass'y
34-1	QBP2006A	Tape Pressure Spring
35	SUS796	Holder Spring
36	SBC736	Eject Button
37	SUB236	Eject Lever
38	SMN1971	Eject Spring
39	QYF0627A	Damper Gear Ass'y
40	SUS801	Meter Pressure Spring
41	SUS805	Earth Plate (B)
42	SUSM7	Eaeth Spring
43	SUS804	Earth Plate (A)
44	SMN1969	Connector Angle
45	SMN1966	Holder Angle

SCREWS, NUTS & WASHERS

Ref. No.	Part No.	Part Name & Description
N 1	XTN3 + 12B	Tapping Screw ⊕3 × 12
N 2	XSN3 + 6S	Screw ⊕3 × 6
N 3	XTV3 + 6B	Tapping Screw ⊕3 × 6
N 4	XTN26 + 8B	Tapping Screw ⊕2.6 × 8
N 5	XTV3 + 10BFN	Screw ⊕3 × 10
N 6	XTN3 + 10B	Screw ⊕3 × 10
N 7	XTB3 + 8B	Screw ⊕3 × 8
N 9	XTS3 + 8B	Screw ⊕3 × 8
N 10	XTB3 + 10BFZ	Screw⊕3 × 10
N 11	QHQ1324K "Black Type"	Ornament Screw
N 11	QHQ1324 "Silver Type"	Ornament Screw
N 12	XWG3	Washer 3φ
N 13	XWA3B	Washer 3φ

ACCESSORIES

Ref. No.	Part No.	Part Name & Description
A 1 [M]	SQFM22	Instruction Book
A 1 [MC]	SQFM23	Instruction Book
A 1 [E][EK][EH][EGA][PA][PE][XA][XL]	SQFM24	Instruction Book
A 3 [M][MC] ⚠	SJA170	Power Cord
A 3 [E][EH][EGA] ⚠	SFDAC05E02	Power Cord
A 3 [EK] ⚠	SFDAC05G02	Power Cord
A 3 [PA][PE][XA] ⚠	SJA168	Power Cord
A 3 [XL] ⚠	SJA173	Power Cord
A 4	SJP2129-5	Connection Cord

PACKINGS

Ref. No.	Part No.	Part Name & Description
P 1 [M]	SPGM17	Carton Box
P 1 [MC][E][EH][EGA]		
[XL]	SPGM28 "Silver Type"	Carton Box
P 1 [E][EH][EGA][PA][PE]		
[XL]	SPGM29 "Black Type"	Carton Box
P 1 [EK]	SPGM31 "Black Type"	Carton Box
P 1 [EK]	SPGM30 "Silver Type"	Carton Box
P 1 [XA]	SPGM46 "Black Type"	Carton Box
P 1 [XA]	SPGM45 "Silver Type"	Carton Box
P 2	SPSM4	Cushion (R)
P 3	SPSM5	Cushion (L)
P 4	QPC0072	Poly Sheet
P 5	XZB40X60A02	Protection Cover

M MC E EK EGA EH XA XL PA PE

Printed in Japan
850513000 Ⓗ M.S

DEUTSCH

Verwenden Sie bitte diese Broschüre Zusammen mit der Service-Anieitung für das Modell Nr. RS-B49R.

■ TECHNISCHE DATEN

System	Stereo-Cassettendeck
Spuren	4 Spuren, 2 Kanäle
Tonköpfe	
Aufnahme/Wiedergabe	MX-Kopf
Löschen	Ferrit-Kopf mit Doppelspalt
Motor	1-Motor
Aufnahmesystem	Wechselstrom-Vormagnetisierung
Vormagnetisier ungsfrequenz	80 kHz
Löschsystem	Wechselstrom-Vormagnetisierung
Bandgesch windigkeit	4,8 cm/s
Frequenzgang	
Reineisenbänder	20 Hz~17.000 Hz
	30 Hz~17.000 Hz (DIN)
	40 Hz~16.000 Hz±3 dB
CrO_2-Bänder	20 Hz~17.000 Hz
	30 Hz~16.000 Hz (DIN)
	40 Hz~15.000 Hz±3 dB
Normalbänder	20 Hz~16.000 Hz
	30 Hz~15.000 Hz (DIN)
	40 Hz~14.000 Hz±3 dB
Dynamischer Bereich (mit dbx-Rauschunterdrückung)	110 dB (1 kHz)
Geräuschspannungsabstand (Signalpegel= max. Aussteuerungspegel, CrO_2-Band)	
mit dbx-Rauschunterdrückung	92 dB (nach A bewertet)
mit Dolby-C-Rauschunterdrückung	75 dB (CCIR)
mit Dolby-B-Rauschunterdrückung	67 dB (CCIR)
ohne Rauschunterdrückung	57 dB (nach A bewertet)

Gleichlauschwankungen	0,08% (WRMS)
	±0,14% (DIN)
Max. Eingangspegelverbesserung (mit dbx)	10 dB (1 kHz)
Umspulzeit	90 s für C-60-Cassette
Eingangsempfindlichkeit und Impedanz	
MIC	0,25 mV/400Ω~10 kΩ
LINE	60 mV/47 kΩ
Ausgangsspannung und Impedanz	
LINE	400 mV/1,5 kΩ
HEADPHONES	80 mV/8Ω
Stromaufnahme	20 W
Stromversorgung	Wechselstrom 50/60 Hz, 220 V für Europa, außer England, 110/127/220/240 V für andere Länder. (voreingestellte Netzspannung 240 V.)
Abmessungen (B×H×T)	430×100,5×229,5 mm
Gewicht	3,7 kg

Anm.: Wenn nicht anders vorgeschrieben, Drehschalter und Steuereinrichtungen auf die folgenden Positionen stellen.
- Für saubere Köpfe sorgen.
- Für saubere Tonwelle und Andruckrolle sorgen.
- Auf normale Raumtemperatur achten: 20±5°C (68±9°F)
- Timer-Startschalter: OFF
- Eingangsregler: MAX
- Dolbyschalter: AUS
- Abgleichkontrolle: Mitte (Zentrum)
- Mode Taste: ⬭ mode
- Unbeschriebene Auslassungstaste: OFF

■ MESSUNGEN UND EINSTELL METHODEN

Ⓐ **Senkrechtstellen des Kopfes**	Bedingung: • Wiedergabe (Vorlauf-Rücklauf)	Meßgerät: • Elektronische Voltmeter • Oszillograph • Testband (azimuth) ...QZZCFM • Testband...QZZCRD

Ausgangsbalance-Justierung für linken und rechten Kanal

1. Den Meßaufbau zeigt Fig. 2.
2. In der Forward-Playback Stellung das 8 kHz Signal des QZZCFM Testbandes wiedergeben. Die Azimuth-Schraube (Vorlauf), die Abbildung 3 zeigt, auf maximalen Ausgangspegel des linken und rechten Kanals abgleichen.
   Sind die Ausgangspegel des linken und rechten Kanals nicht gleichzeitig maximal, wie folgt justieren:

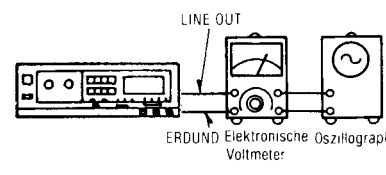


Fig. 2

3. Durch Drehcn der in Abbildung 3 gezeigten Azimuth-Schraube (Vorlauf) die Winkel A und C auffinden (den Punkt wo der Spitzenausgangspegel für den linken, bzw. rechten Kanal erreicht wird, ermitteln). Anschließend den Winkel B zwischen den Winkeln A und C, d.h. den Punkt, wo der Ausgangspegel des linken und rechten Kanals bei maximalem Pegel zusammentreffen, ermitteln. (Siehe Abbildung 3 und 4).
4. In der Reverse Playback Stellung die Azimuth-Schraube (Rücklauf) wie oben beschrieben einstellen.

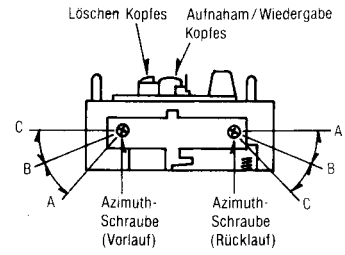


Fig. 3

Phasenjustierung für linken und rechten Kanal

5. Den Meßaufbau zeight Fig. 5.
6. In der Foreward Playback Stellung das 8kHz Signal des Testbandes (QZZCFM) wiedergeben. Die in Abbildung 3 gezeigte Azimuth-Schraube (Vorlauf) so einstellen, daß die Zeiger von zwei Röhrenvoltmetern auf Maximum ausschlagen, und am Oszillographen eine wie in Abbildung 6 gezeigte Wellenform erreicht wird.
7. In der Rücklauf Playback Stellung die Azimuth-Schraube (Rücklauf) wie oben beschrieben einstellen. Prüfung der Pegelabwiechung im Vorwärts-und Rückwärtslauf.
8. Das Playback Pegelsignal (315kHz bei 0dB) auf dem Standerd Playback Meßband wiedergeben und prüfen, daß sich die Pegelabweichung bei Rückwärts-und Vorwärtslauf innerhalb von 1,0dB befindet.
9. Nach der Einstellung die Löschkopfhöhe endgültig festlegen und die Winkel der Einstellungsschrauben bestimmen.

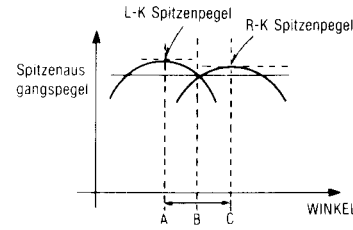


Fig. 4

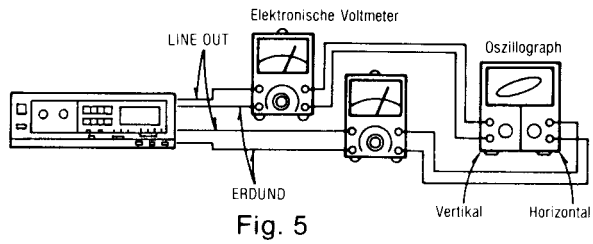


Fig. 5

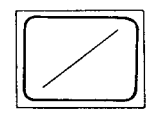
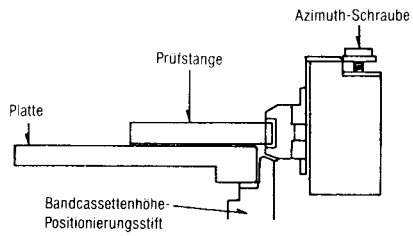


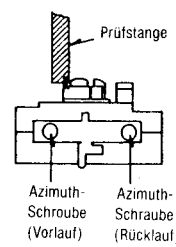
Fig. 6

Tonkopfhöheneinstellung durch Verwendung der Tonkopfeinstellungsschablonc (QZZ0207)

Die Tonkopfeinstellungsschablone erlaubt genaues und schnelles Einstellen der Tonkopfhöhe in folgender Weise.

a. Die Platine in den Mechanismus einlegen.
b. Den Mechanisumus auf Play Stellung schalten.
c. Den Prüfungsstift auf die Platine auflegen.
d. Den Prüfungsstift durch jeden Löschkopf stekken.
e. Die Höheneinstellungsschraube so einstellen, daß der Prüfungsstift keinen der Löschköpfe berührt.
f. Testband (Bandverlaufbeobachter QZZCRD) abspielen und darauf achten, daß das Band die Lösch-Köpfe nicht berührt (flattert usw.).
g. Danach die Punkte 1 bis 7 des Einstellungsvorganges durchführen.





Ⓑ Bandgeschwindigkeit

Bedingung:
- Wiedergabe

Meßgerät:
- Elektronischer Digitalzähler
- Testband...QZZCWAT

Genauigkeit der Bandgeschwindigkeit

1. Den Meßaufbau zeigt Fig. 7.
2. Testband (QZZCWAT 3000Hz) wiedergeben und Ausgangssignal dem Zähler zuführen.
3. Frequenz messen.

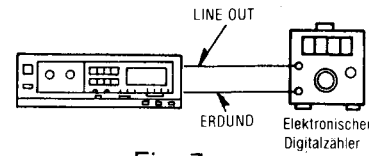


Fig. 7

4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000Hz, so ergibt sich die Genauigkeit nach folgender Formel:

$$\text{Genauigkeit der Bandgeschwindigkeit} = \frac{f-3000}{3000} \times 100(\%)$$

worin f die gemessene Frequenz ist.

5. Die Messung soll im mittleren Teil des Bandes erfolgen.

NORMALWERT: 0,33% (3000±10%)

6. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, bitte mit Bandgeschwindigkeitsregler VR wie in Fig. 1 gezeigt einstellen.

Anmerkung: Bitte bei dieser Einheit zum Justieren der Bandgeschwindigkeit keinen Metallschraubenzieher benutzen.

Schwankung der Bandgeschwindigkeit:

Messung, wie oben beschrieben für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen:

$$\text{Schwankung} = \frac{f_1-f_2}{3000} \times 100(\%)$$

f_1 = Maximalwert
f_2 = Minimalwert

NORMALWERT: 1,5%

Ⓒ Frequenzgang bei Wiedergabe

Bedingung:
- Wiedergabe (Vorlauf—Rüklauf)

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband...QZZCFM

1. Den Meßaufbau zeigt Fig. 2.
2. Gerät auf Wiedergabe schalten. Frequenzgang-Testband QZZCFM wiedergeben.
3. Ausgangsspannung bei 315Hz, 12,5kHz, 8kHz, 1kHz, 250Hz, 125Hz und 63Hz messen und jede Ausgangsspannung mit der Standardfrequenz 315Hz an der LINE OUT vergleichen.
4. Messungen an beiden Kanälen durchführen.
5. Prüfen, ob die gemessenen Werte innerhalb des in der Frequenzgang-Übersicht aufgeführten Bereichs liegen. (Siehe Fig. 8.)

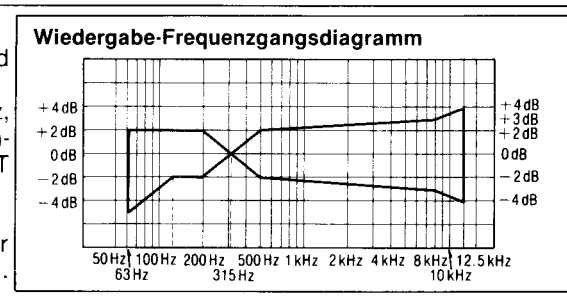


Fig. 8

Ⓓ Wiedergabe-Verstärkung

Bedingung:
- Wiedergabe (Vorlauf—Rüklauf)

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband...QZZCFM

1. Den meßaufbau zeigt Fig. 2.
2. Den Standard-Aufnahmepegelteil der Testbandcassette (QZZCFM, 315Hz) wiedergeben und mit dem Elektronische Voltmeter den Ausgangspegel an den LINE OUT-Anschlüssen messen.
3. Messung an beiden Kanälen durchführen.

NORMALWERT: 0,4V±0,05V

Einstellung:

1. Abweichungen können durch Abgleich von VR5 (linker Kanal) und VR6 (rechter Kanal), korrigiert werden.
2. Nach erfolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.

Ⓔ Löschstrom

Bedingung:
- Aufnahme

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband (Leerband) ...QZZCRZ für Metall

1. Den Meßaufbau zeigt Fig. 9.
2. Das Reineisenband-Referenzleerband (QZZCRZ) einsetzen.
3. Den Bandwahlschalter auf Metallband-Position stellen.

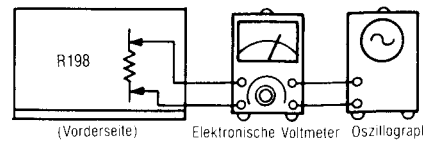


Fig. 9

4. Löschstrom nach folgender Formel emitteln:

$$\text{Löschstrom (A)} = \frac{\text{Die Spannung über beide Enden von R198}}{\text{1 (Ohm)}}$$

NORMALWERT: 190 $^{+10}_{-15}$ mA (Metal position) (190 $^{+10}_{-15}$ mV)

5. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, auf folgenden Weise einstellen.

Einstellung:

1. Die Register R200, R201, R202 kurzschließen. (Siehe Tabelle 1)
2. Den Löschstrom messen.
3. Falls der gemessene Wert nicht innerhalb des vorgeschriebenen Bereichs liegt, die Register R200, R201, R202 gemäß Tab. 1 öffnen oder kurzschließen.

R200	R201	R202	Änderung des Wertes	Zeichnung
Kurzschließen	Kurzschließen	Kurzschließen	±0mA	R200 R201 R202 Gelötet
Kurzschließen	Kurzschließen	Öffnen	+4mA	R200 R201 R202 Gelötet
Öffnen	Kurzschließen	Kurzschließen	+10mA	R200 R201 R202 Gelötet
Öffnen	Öffnen	Öffnen	+20mA	R200 R201 R202

Tabelle 1

Ⓕ Gesamtfrequenzgang

Bedingung:
- Aufnahme und Wiedergabe
- Betriebsart "Normalband"
- Betriebsart "CrO_2 Band"
- Betriebsart "Metallband"
- Eingangsregler...MAX

Meßgerät:
- Elektronische Voltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Testband (Leerband)
  ...QZZCRA für Normal
  ...QZZCRX für CrO_2
  ...QZZCRZ für Metall
- Widerstand (600Ω)

Anm.:

Vor Messung und Abgleich des Gesamtfrequenzganges ist sicherzustellen, daß der Frequenzgang bei Wiedergabe korrekt ist (Vgl. entspr. Abschnitt).

Gesamtfrequenzgang-Justierung durch Aufnahme-Vomagnetisierungsstrom

(Der Aufnahme-Entzerrer ist fest eingestellt.)

1. Den Meßaufbau zeigt Fig. 11.
2. Gerät auf Betriebsart "Normalband" schalten, und Testband (QZZCRA) einlegen.
3. An LINE IN ein Signal von 1kHz, −24dB zuführen. Das Gerät auf Aufnahme schalten.
4. Den Dämpfungswiderstand feineinstellen, bis die Ausgangsleistung an LINE OUT 0,4V beträgt.
   • Überprüfen, daß der Signalausgangspegel bei einer Ausgangs-Spannung von 0,4V −24±4dB beträgt.
5. Mit dem NF-Oszillator Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz und 12.5kHz zuführen, und diese Signale auf das Testband aufzeichnen.
6. Die in Schritt 5 aufgezeichneten Signale wiedergeben und überprüfen, ob die Frequenzgangkurve innerhalb des Bereichs liegt, der im Frequenzgangdiagramm für normales Band in Fig. 10 gezeigt ist. (Falls die Kurve innerhalb des vorgeschriebenen Bereichs liegt, mit den Schritten 7, 8 und 9 weiterfahren.)
   Falls die Kurve außerthalb des vorgeschriebenen Bereichs liegt, wie folgt justieren.

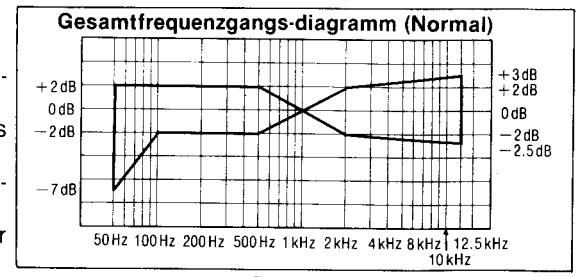


Fig. 10

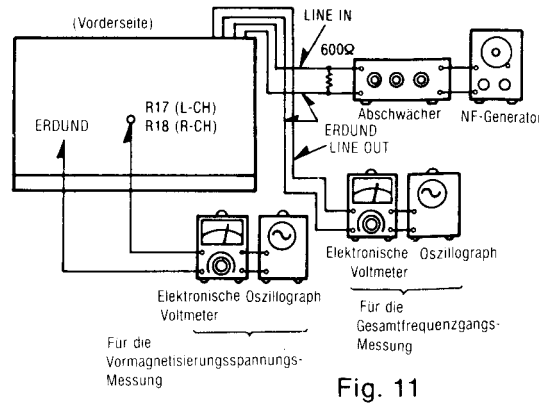


Fig. 11

Justierung (A):

Wenn die Kurve den vorgeschriebenen Gesamtfrequenzgangbereich (Fig. 10) überschreitet, wie in Fig. 12 gezeigt.

1) Den Votmagnetisierungsstrom durch Abgleichen von VR11 (linker Kanal) und VR12 (rechter Kanal) erhöhen.

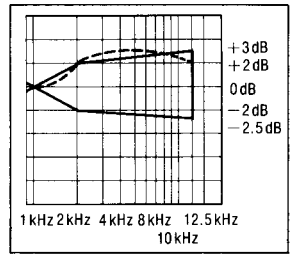


Fig. 12

2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Wenn die Kurve dabei innerhalb des vorgeschriebenen Bereichs liegt (Fig. 10) mit den Schritten 7, 8, und 9 weiterfahren.)
3) Wenn die Kurve den vorgeschriebenen Bereich (Fig. 10) noch immer überschreitet, den Vormagnetisierungsstrom weiter erhöhen, und die Schritte und wiederholen.

Justierung (B):

Wenn die Kurve unter den vorgeschriebenen Bereich für den Gesamtfrequenzgang (Fig. 10) absinkt, wie in Fig. 13 gezeigt:

1) Den Vormagnetisierungsstrom durch abgleichen von VR11 (linker Kanal) und VR12 (rechter Kanal) reduzieren.

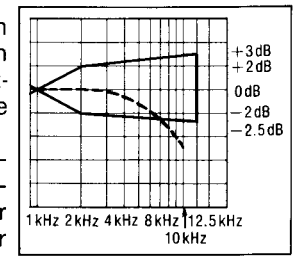


Fig. 13

2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Falls die Kurve dabei innerhalb des vorgeschriebenen Bereichs in Fig. 10 liegt, mit den Schritten 7, 8, und 9 weiterfahren.)
3) Falls die Kurve noch immer unter den vorgeschriebenen Bereich (Fig. 10) absinkt, den Vormagnetisierungsstrom weiter reduzieren, und Schritte 5 und 6 wiederholen.

7. Gerät auf Betriebsart "CrO_2 Band" schalten.
8. Testband QZZCRX einlegen, und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz und 14kHz aufzeichnen; Anschliessend die Signale wiedergeben und prüfen, ob die Kurve innerhalb des Bereichs liegt, der im Gesammtfrequenzgang-Diagramm für das CrO_2 Band dargestellt ist. (Fig. 14.)
9. Gerät auf Betriebsart "Metallband" schalten. Testband QZZCRZ einlegen und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz und 14kHz aufnehmen. Anschließend die Signale wiedergeben und prüfen, ob die Kurve innerhalb des Bereichs im Gesamtfrequenzgangdiagramm für Metallband liegt. (Fig. 14.)
10. Überprüfen, daß die Vorspannung ungefähr den folgenden Werten entsprechen, wenn der Bandsortenschalter in die entsprechende Position gestellt ist.

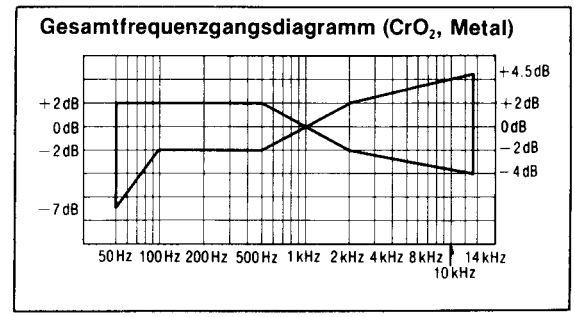


Fig. 14

- Die spannung an den Anschlüssen des Widerstandes R17 (L-K) [R18 (R-K)] ablesen und den Vormagnetisierungsstrom entsprechend folgender Formel berechnen.

$$\text{Vormagnetisierungsstrom (A)} = \frac{\text{Spannung am Röhrenvoltmeter (V)}}{10\ (\Omega)}$$

Bezugswert: Ungefähr 420μA (Normal position)
Ungefähr 560μA (CrO_2 position)
Ungefähr 900μA (Metall position)

G Gesamtverstärkung

Bedingung:
- Aufnahme und Wiedergabe
- Betriebsart: Normalband
- Eingangsregler: MAX
- Standard-Eingangspegel:

Mikrofon .....-72^{+5}_{-3}dB (0,25mV)
NF-Eingang.....-24 ± 4dB (60mV)

Meßgerät:
- Elektronische Voltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)
- Testband (Leerband)
  ...QZZCRA für Normal

1. Den Meßaufbau zeigt Fig. 15.
2. Normales Testleerband (QZZCRA) einlegen.
3. Gerät auf "Aufnahme" schalten.
4. Über den Abschwächer ein 1kHz-Signal (−24dB) vom NF-Generator dem NF-Eingang zuführen.
5. ATT justieren, bis der Monitorpegel an den LINE OUT-Anschlüssen 0,4±0,05V beträgt.
6. Eine bespielte Cassette wiedergeben und überprüfen, ob der Ausgangspegel an den LINE OUT-Anschlüssen 0,4±0,05V beträgt.
7. Wenn der gemessene Wert nicht 0,4±0,05V erreicht, die folgenden VR abgleichen: VR7 (L-K) oder VR8 (R-K).
8. Ab Punkt 2 wiederholen.

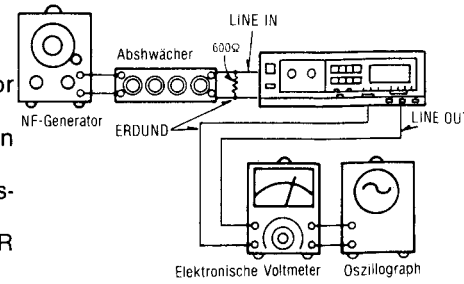


Fig. 15

ⓗ **Fluoreszenzmeter**	Bedingung: • Aufnahme • Eingangsregler...MAX	Meßgerät: • Elektronische Voltmeter • Abschwächer • NF-Generator

Überprüfung des Fluoreszenzmeters

Um die Genauigkeit des Fluoreszenzmeters zu überprüfen, die Ausgangsspannung an der LINE OUT messen. (R-K)] messen.

1. Den Meßaufbau zeigt Fig. 15.
2. In Betriebsart "Aufnahme-Pause" 1kHz (−24dB) Signal an den NF-Eingang geben.
3. Abschwächer so abstimmen, daß der Ausgangspegel an der LINE OUT 0,4±0,05V ist.

Überprüfung des FL-Meters 0dB Segment-Anzeige ON/OFF

Den Ausgangspegel an LINE OUT von 0,4—0,05V auf 0,4+0,05V durch Abstimmung des Abschwächers verändern und prüfen, ob die 0dB Segment-Anzeige des FL-Meters von OFF auf ON wechselt.

Überprüfung des FL-Meters −40dB Segment-Anzeige ON/OFF

Senken des Signalpegels von 28dB unter den Standard-Eingangspegel (−24dB−28dB=−52dB=2,5mV) und weiterhin den Pegel 12dB (−52dB−12dB=−64dB=0,63mV) durch Abstimmung des Abschwächers senken. Beim Senken des Pegels, wie oben beschrieben, sicherstellen, daß nur die −40dB-Anzeige aufleuchtet oder bei niedrigstem Stand erlischt.

Justierung des FL-Meters

1. Den Meßaufbau zeigt Fig. 15.
2. In Betriebsart "Aufnahme-Pause" 1kHz (−24dB) Signal an den NF-Eingang geben.
3. Abschwächer so abstimmen, daß der Ausgangspegel an der LINE OUT 0,4±0,05V beträgt.

Justierung auf −40 dB

4. Abschwächer so abstimmen, daß der in Stufe 3 abgestimmte Pegel um 40 dB vermindert wird.
5. Zu diesem Zeitpunkt prüfen, ob der −40dB Anzeiger abgeschwächt leuchtet (mittelhell, zwischen ganz hell und erlöscht: siehe Fig. 16).
6. Wenn der Anzeiger nicht, wie in Stufe 5 beschrieben, abgeschwächt leuchtet, VR9 abstimmen.

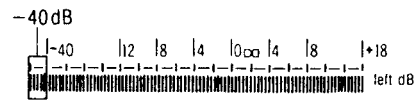


Fig. 16

Justierung auf 0dB

7. Den Zustand von Stufe 3 herstellen. Ausgangspegel auf 0,4±0,05V an der LINE OUT festsetzen.
8. Zu diesem Zeitpunkt prüfen, ob der 0 dB Anzeiger abgeschwächt aufleuchtet (mittelhell, zwischen ganz hell und erlöscht siehe Fig. 17).
9. Wenn nicht korrekt, VR10 abstimmen.
10. Einstellungen und Prüfungen der Stufen 3, 4, 5, 6, 7, 8 und 9 zweibis dreimal wiederholen.

Fig. 17

ⓘ **Dolby-Schaltung**	Bedingung: • Aufnahme • Dolby-Schalter ...IN/OUT (AN/AUS) • Dolby-Wahlschalter ...B/C • Eingangsregler...MAX. • Abgleichkontrolle : Mitte (Zentrom)	Meßgerät: • Elektronische Voltmeter • NF-Generator • Abschwächer • Oszillograph • Widerstand (600Ω)

Aufnahmeseite

• Überprüfung der Dolby-B-Typ Verschlüsselungsmerkmale.

1. Den Meßaufbau zeigt Fig. 18.
2. Gerät auf "Aufnahme" stellen. (Dolby-Wahlschalter ist OUT (AUS).)
3. Dem NF-Eingang ein 1kHz-Signal zuführen.
4. Abschwächer so abstimmen, daß die Ausgangsspannung an Nadel 7 von IC3 (L-K) und IC4 (R-K) 12,3mV beträgt.
5. Die Ausgangsspannung an Nadel 21 sollte 0dB betragen (375mV).
6. Den Dolby-Wahlschalter auf B stellen. Sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +6dB±2dB beträgt (760mV).
7. Dolby-Wahlschalter ausschalten und die Frequenz auf 5kHz abstimmen. Das Ausgangssignal an Nadel 21 sollte 0dB betragen (375mV).
8. Dolby-Wahlschalter auf B stellen und sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +8dB±2dB beträgt (960mV).

• Überprüfung der Dolby-C-Typ Verschlüsselungsmerkmale

9. Obige Stufen 1 bis 5 wiederholen.
10. Dolby-Wahlschalter auf C stellen und sichersteilen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +11,5dB±2dB beträgt (1,5V).
11. Dolby-Wahlschalter ausschalten und die Frequenz auf 5kHz abstimmen.
    Die Ausgangsspannung an Nadel 21 sollte 0dB sen (375mV).
12. Dolby-Wahlschalter auf C stellen und sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +8,5dB±2dB beträgt (980mV).

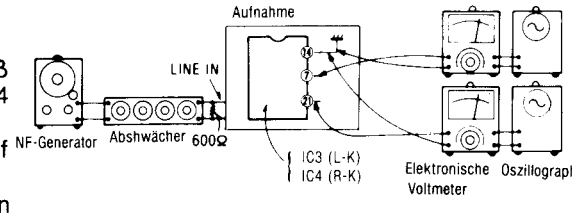


Fig. 18

❾ Einsatz Ausgleichszeit-Justierung (dbx Schaltung)

Meßbedingung:
- Betriebsart Aufnahme
- Eingangspegelregler...MAX
- Abgleichkontrolle ...Mitte (Zentrum)
- Gerauschverminderungs-Schalter...dbx Band

Meßgeräte:
- Elektronische Voltmeter
- Dämpfungeglied
- NF-Generator
- Gleichstromvoltameter

Ausgangsregler

1. Führen Sie die in Fig. 19 gezeigten Anschlüsse durch und gegen Sie ein 1kHz–27dB Signal vom LINE IN ein und stellen Sie den Lärmreduktionswähler in die Position dbx.
2. Versetzen Sie das Gerät in die Betriebsart Aufnahme und stellen Sie das Dämpfungsglied so ein, daß der Signalpegel beim C115 (L-K) und beim C116 (R-K) 300mV ist.
3. Voltzahl auf DC Voltmeter ablesen.

Bezugswert: 15±0,5mV

4. Weicht der Meßwert vom Bezugswert ab, VR14 abgleichen.

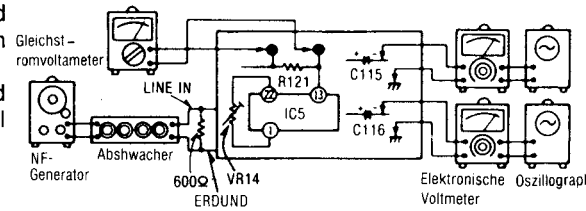


Fig. 19

❿ Fotosensor-Schaltung

Bedingung:
- Wiedergabebetrieb

Anmerkung:
Für die Justierung der Fotosensor-Schaltung sind die Front-platte, der Cassettenfachdeckel und die Anzeigetafel montiert zu lassen. (Licht von außen könnte Funktionsstörung des Fotosensors im Cassettenfachdeckel verursachen und exakte Justierung verunmöglichen.)

Empfindlichkeits-Justierung
Gewisse Funktionnstörungen wie Umschaltung der Laufrichtung oder automatischer Stop können möglicherweise auftreten; dies ist bei gewissen Bandtypen und -marken möglich. Falls solche Störungen nur durch Bandfalten verursacht werden, sind folgenden Justierungen vorzunehmen.

1. Während des Abspielens des Teils, der die Funktionsstörung verursacht, ist VR13 zu justieren, so daß der Betrieb normal wird.
2. Danach den Vorbandteil wiedergeben und auf normalen Betrieb (daß Umschaltung der Bandlaufrichtung und automatischer Stop eliminiert sind) überprüfen.

FRANÇAIS

Ceci est à utiliser conjointement avec le manuel d'entretien du modèle No. RS-B49R.

■ CARACTERISTIQUES

Platine	Platine magnéto-cassette stéréo
Pistes	4 pistes, 2 canaux
Têtes	
ENREGISTREMENT/LECTURE	Tête en MX
Effacement	Tête en ferrite à double entrefer
Moteur	1-moteur
Système d'enregistrement	Polarisation CA
Fréquence de polarisation	80 kHz
Système d'effacement	Polarisation CA
Vitesse de défilement de la bande	4,8 cm/sec.
Réponse en fréquence	
Métal	20 Hz~17.000 Hz 30 Hz~17.000 Hz (DIN) 40 Hz~16.000 Hz±3 dB
CrO_2	20 Hz~17.000 Hz 30 Hz~16.000 Hz (DIN) 40 Hz~15.000 Hz±3 dB
Normal	20 Hz~16.000 Hz 30 Hz~15.000 Hz (DIN) 40 Hz~14.000 Hz±3 dB
Portée dynamique (avec système dbx)	110 dB (1 kHz)
Rapport signal/bruit (niveau de signal=niveau d'enregistrement maximum, bande magnétique de type CrO_2)	
Système dbx	92 dB (A pondéré)
Système de Dolby C	75 dB (CCIR)
Système de Dolby B	67 dB (CCIR)
Pas de système de NR	57 dB (A pondéré)
Pleurage et scintillement	0,08% (WRMS) ±0,14% (DIN)
Amélioration du niveau d'entrée maximum (avec système dbx)	10 dB (1 kHz)
Temps d'avance rapide et de rebobinage	Environ 90 secondes pour une cassette C-60
Sensibilité et impédance d'entrée	
MIC	0,25 mV/400Ω~10 kΩ
LIGNE	60 mV/47 kΩ
Tension et impédance de sortie	
LIGNE	400 mV/1,5 kΩ
HEADPHONES	80 mV/8Ω
Consommation	20 W
Alimentation	C.A. 50/60 Hz, 220 V pour l'Europe, sauf le Royaume-Unis, 110/127/220/240 V, Tension d'alimentation préréglée 240 V pour les autres régions.
Dimensions (L×H×P)	430×100,5×229,5 mm
Poids	3,7 kg

REMARQUES: Placer les interrupteurs et les contrôles dans les positions suivantes, sauf indication contraire.
- Vérifier que les têtes soient propres.
- Vérifier que le cabestan et le galet presseur soient propres.
- Température ambiante admissible: 20±5°C
- Interrupteur de démarrage de la minuterie: OFF
- Contrôles de niveau d'entrée: Maximum
- Interrupteur de réduction de bruit: OUT
- Contrôle de l'équilibre: Centre
- Commande de mode: ⬭ mode

■ METHODES DES MEASURES ET REGLAGES

Ⓐ Réglage de l'azimut de tête

Condition:
- Mode de lecture (En avant • En sens inverse)

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon (azimut) ...QZZCFM
- Bande étalon...QZZCRD

Réglage de l'équilibre de la sortie au canal gauche/canal droit

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Dans le mode de lecture avant, reproduire le signal de 8kHz de la bande étalon (QZZCFM).
   Régler la vis d'azimutage (Avant) indiquée dan la Fig. 3 pour obtenir les niveaux de sortie maximum pour les canaux gauche et droit.
   Lorsque les niveaux de sortie des canaux gauche et droit ne sont pas simultanément à leur maximum, les régler à nouveau de la façon suivante.

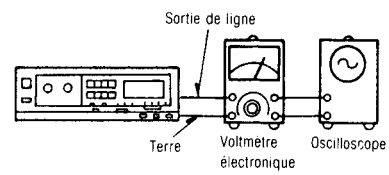


Fig. 2

3. Tourner la vis d'azimutage (Avant) indiquée dan la Fig. 3 pour obtenir les angels A et C (points où les niveaux de sortie de crête pour les canaux gauche et droit sont obtenus respectivement). Localiser ensuite l'angle B entre les angles A et C, autrement dit, en un point où les niveaux de sortie des canaux gauche et droit atteignent tous les deux leur maximum. (Voir les Fig. 3 et 4.)
4. Dans le mode de lecture en sens inverse, régler la vis d'azimutage (sens inverse) de la maniére citée cidessus.

Réglage de phase canal gauche/canal droit

5. Brancher les appareils comme indiqué dans la Fig. 5.
6. Dans le mode de lecture avant, reproduire le signal de 8kHz de la bande étalon (QZZCFM). Régler la vis d'azimutage (Avant) indiquée dans la Fig. 3, de aorte que les aiguilles des deux voltmètres électroniques oscillent au maximum, et qu'on obtienne sur l'oscilloscope une forme d'onde semblable à celle indiquée dans la Fig. 6.
7. Dans le mode de lecture en sens inverse, régler la vis d'azimutage (sens inverse) de la manière citée cidessus. Vérification de la différence de niveau entre les modes de lecture en avant et en sens inverse.

8. Reproduire le signal de 8kHz (315Hz à 0dB) de la Cassette étalon standard, et vérifier que la différence de niveau entre les modes de lecture avant et lecture inverse ne dépasse pas 1 dB.
9. Après réglage, immobiliser les vis de réglage de la tête d'effacement et de réglage d'angle.

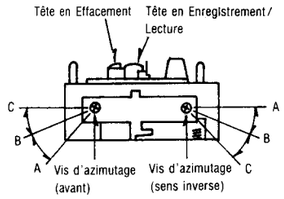


Fig. 3

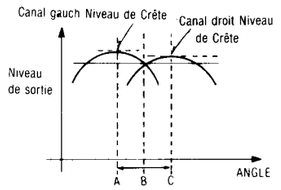


Fig. 4

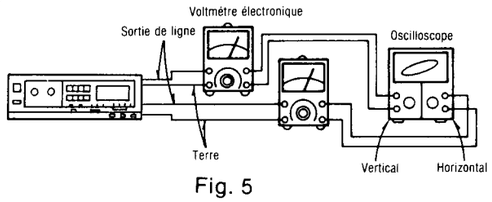


Fig. 5

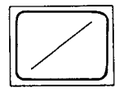
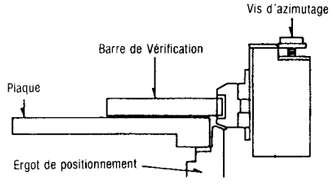
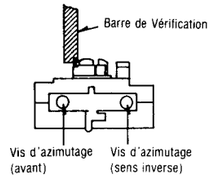


Fig. 6

Réglage de l'alignement à l'aide du gabarit de réglage (QZZ0207)

Le gabarit de réglage de tête (QZZ0207) permet un réglage rapide et précis de l'alignement:
a. Placer la plaque sur le mécanisme.
b. Régler le mécanisme sur le mode PLAY.
c. Placer la tige de contrôle aur la plaque.
d. Passer la tige de contrôle dans chaque tête d'effacement.
e. Régler les vis d'alignement de sorte que la tige de contrôle ne touche aucune des têtes d'effacement.
f. Utiliser une cassette à mirroir (QZZCRD) pour vêrifier que le ruban ne touche pas (ne s'enroule pas autour) les têtes d'effacement.
g. Répéter ensuite les étapes de 1 à 7 de la procédure de réglage.





Ⓔ Vitesse de défilement

Condition:
- Mode de lecture

Equipement:
- Fréquencemètre numérique
- Bande étalon...QZZCWAT

Précision de la vitesse de défilement

1. Brancher les appareils comme indiqué dans la Fig. 7.
2. Lire la bande étalon (QZZCWAT, 3000Hz) et appliquer le signal de lecture au fréquencemètre numérique.
3. Mesurer sa fréquence.
4. Sur la base de 3000Hz, déterminer la valeur à l'aide de la formule.

$$\text{Précision de vitesse} = \frac{f-3000}{3000} \times 100(\%)$$

avec f = valeur mesurée.

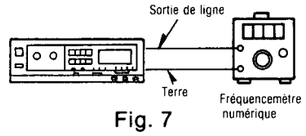


Fig. 7

5. Effectuer la mesure sur la partie médiane de la bande.

Valeur standard: 0,33% (3000±10%)

6. Si la valeur mesurée ne correspond pas à la valeur standard, régler au moyen de la vis VR de réglage de la vitesse de défilement indiquée dans la Fig. 1.
Remarque: Utiliser un tournevis qui ne soit pas métallique pour le réglage de la précision de la vitesse de défilement sur cette unité.

Fluctuations de vitesse de défilement

Faire les mesures de la même façon que ci-dessus (au début, au milieu et en fin de bande) et déterminer la différence entre les valeurs maximale et minimale, puis calculer comme suit.

$$\text{Fluctuations de vitesse} = \frac{f_1-f_2}{3000} \times 100(\%)$$

f_1 = valeur maximale
f_2 = valeur minimale

Valeur standard: 1,5%

Ⓒ Réponse en fréquence à la lecture

Condition:
- Mode de lecture (En-avant • En sens inverse)

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon ...QZZCFM

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Lire la portion de réponse en fréquence de la bande étalon (QZZCFM).
3. Mesurer les niveaux de sortie à 315Hz, 12,5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, et 63Hz et comparer chaque niveau de sortie avec celui de la fréquence standard de 315Hz sur la borne LINE OUT.
4. Effectuer les mesures sur les deux canaux.
5. Vérifier que les valeurs mesurées se situent dans la bande spécifiée de la courbe de réponse en fréquence. (Voir Fig. 8).

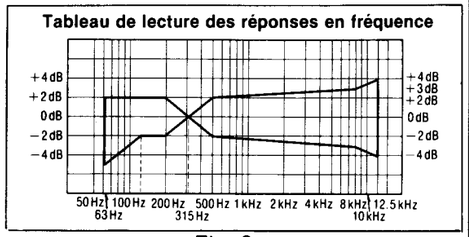


Fig. 8

Ⓓ Gain à la lecture

Condition:
- Mode de lecture (En-avant • En sens inverse)

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon...QZZCFM

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Faire jouer la portion du niveau d'enregistrement normal sur la bande d'essai (QZZCFM, 315Hz) et, en utilisant un voltmètre électronique, mesurer le niveau de sortie aux sorties en ligne.
3. Effectuer les mesures sur les deux canaux.

Valeur standard: 0,4V±0,05V

Réglage

1. Si la valeur mesurée ne correspond pas à la valeur standard régler VR5 (canal gauche) ou VR6 (canal droit).
2. Après réglage, vérifier à nouveau la "réponse en fréquence à la lecture".

Ⓔ Courant d'effacement

Condition:
- Mode d'enregistrement

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon Vierge ...QZZCRZ pour bande métallique

1. Brancher les appareils comme indiqué dans la Fig. 9.
2. Insérer la bande d'essai vierge de référence métallisée (QZZCRZ).
3. Appuyer sur les boutons d'enregistrement et de pause.
4. Lire le voltage sur le voltmètre électronique et calculer le courant d'effacement au moyen de la formule suivante:

$$\text{Courant d'effacement (A)} = \frac{\text{Voltage à la résistance R198}}{1\ (\Omega)}$$

Valeur standard: 190 $^{+10}_{-15}$ mA(bande métallique) (190$^{+10}_{-15}$ mV)

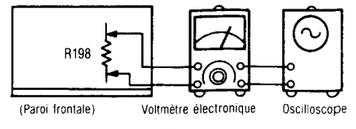


Fig. 9

5. Si la valeur mesurée ne correspond pas à la valeur standard, régler selon les instructions ci-après.

Réglage

1. Court-circuiter les résistances R200, R201, R202. (Se référer à la Table 1.)
2. Mesurer le cournat d'effacement.
3. Si la valeur mesurée n'est pas en deçà du régime, mettre hors circuit ou court ou court-cuircuiter les résistances R200, R201 et R202 selon la Table 1.

R200	R201	R202	Changement de Valeur	Illustration
Court	Court	Court	±0mA	R200 R201 R202 Soude
Court	Court	Hors	+4mA	R200 R201 R202 Soude
Hors	Court	Court	+10mA	R200 R201 R202 Soude
Hors	Hors	Hors	+20mA	R200 R201 R202

Table 1

Ⓕ Réponse de fréquence globale

Condition:
- Mode enregistrement/lecture
- Mode de bande normale
- Mode de bande CrO_2
- Mode de bande métallique
- Contrôles de niveau d'entrée...MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur
- Oscilloscope
- Résistance (600Ω)
- Bande étalon vierge
  ...QZZCRA pour bande normale
  ...QZZCRX pour bande CrO_2
  ...QZZCRZ pour bande métallique

Remarque:

Avant de mesurer et régler la réponse de fréquence globale vérifier que la réponse en fréquence à la lecture soit correcte (pout la méthode de mesure, se reporter au paragraphe intitulé "Réponse en fréquence à la lecture").
(Le compensateur d'enregistrement est fixe.)

1. Brancher les appareils comme indiqué dans la Fig. 11.
2. Placer l'UNITE en mode pour bande normale, et introduire la bande étalon vierge normale (QZZCRA).
3. Appliquer le signal de 1kHz de l'oscillateur AF à la borne LINE IN, par l'intermédiaire de l'atténuateur.
4. Régler l'atténuateur de sorte que le niveau d'entrée soit de 20dB en-dessous du niveau d'enregistrement standard (niveau d'enregistrement standard = 0VU).
5. Régler l'oscillateur AF pour produire des signaux de 50Hz 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz et 12,5kHz et enregistrer ces signaux sur la bande étalon.
6. Reproduire les signaux enregistrés dans la phase 6, et vérifier si la courbe de réponse de fréquence se trouve dans les limites indiquées par la courbe de réponse de fréquence globale pour bandes normales (Fig. 10).
   (Si la courbe est comprise dans les spécifications, passer aux phases 7, 8 et 9).
   Si la courbe ne correspond pas aux spécifications du tableau, régler comme suit.

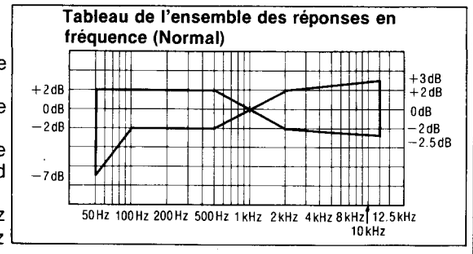


Fig. 10

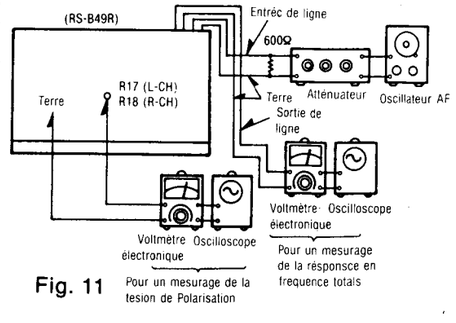


Fig. 11

Réglage (A):

Lorsque la courbe dépasse les spécifications du tableau de réponse de fréquence globale (Fig. 10), comme indiqué dans la Fig. 12.

1) Augmenter le courant de polarisation en tournant VR11 (canal gauche) et VR12 (canal droit).

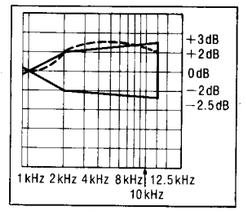


Fig. 12

2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 10).
3) Si la courbe dépasse encore les spécifications (Fig. 10), augmenter encore le courant de polarisation et répéter les phases 5 et 6.

Réglage (B):

Lorsque la courbe tombe au-dessous des spécifications du tableau de fréquence globale (Fig. 10) comme indiqué dans la Fig. 13.

1) Réduire le courant de polarisation en tournant VR11 (canal gauche) et VR12 (canal droit).

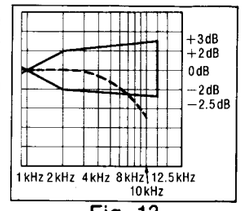


Fig. 13

2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 10).
5) Si la courbe tombe encore au-dessous des spécifications du tableau (Fig. 10), réduire encore le courant de polarisation et répéter les phases 5 et 6.

7. Placer l'UNITE en mode de bande CrO_2.
8. Enlever la bande étalon vierge normale et placer la bande étalon QZZCRX (bande CrO_2). Enregistrer les signaux de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz et 14kHz. Reproduire ensuite ces signaux et vérifier si la courbe est comprise dans les limites indiquées par le tableau de réponse de fréquence globale pour les bandes CrO_2 (Fig. 14).
9. Placer l'UNITE en mode de bande métallique, changer la bande étalon pour la bande étalon vierge QZZCRZ (bande métallique), et enregistrer les signaux de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz et 14kHz. Ensuite, lire les signaux et vérifier si la courbe se trouve entre les limites indiquées dans le tableau de réponse en fréquence globale pour les ruban CrO_2 (Fig. 14.)

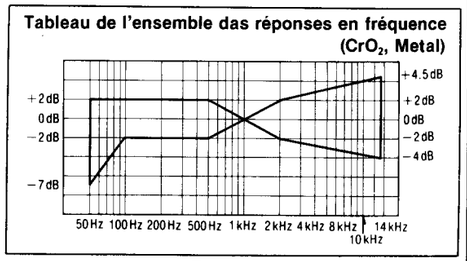


Fig. 14

10. Confirmer que les voltage de polarisation sont approximativement les suivants lorque le sélecteur de bande est mis sur ses différentes positions.
    - Lire la tension aux bornes de la rèsistance R17 (canal gauche) [R18 (canal droit)], et calculer le courant de polarisation á partir de la formule suivante.

$$\text{Cournat de polarisation (A)} = \frac{\text{Tension lue sur voltm.élec. (V)}}{10\ (\Omega)}$$

Valeur référence:	**Autour de 420μA (position: Normal)** **Autour de 560μA (position: CrO_2)** **Autour de 900μA (position: Metal)**

Ⓖ Gain global

Condition:
- Mode d'enregistrement/lecture
- Mode de bande normale
- Contrôles de niveau d'entrée ...MAX
- Niveau d'entrée standard:
  MIC .....-72^{+5}_{-3}dB (0,25mV)
  LINE IN .....−24±4dB (60mV)

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)
- Bande étalon vierge...QZZCRA pour bande normale

1. Brancher les appareils comme indiqué dans la Fig. 15.
2. Introduire la bande étalon vierge (QZZCRA).
3. Placer l'UNITE en mode d'enregistrement.
4. Appliquer le signal de 1kHz de l'oscillateur AF à la borne LINE IN, par l'intermédiaire de l'atténuateur (−24dB).
5. Régler ATT jusqu'à ce que le niveau du moniteur aux sorties de ligne soit de 0,4±0,05V.
6. Faire jouer la bande enregistrée et s'assurer que le niveau de sortie aux sorties en ligne soit de 0,4±0,05V.
7. Si la valeur mesurée n'est pas de 0,4±0,05V, régler au moyen de VR7 (canal gauche) ou VR8 (canal droit).
8. Recommencer à partir de la phase (2).

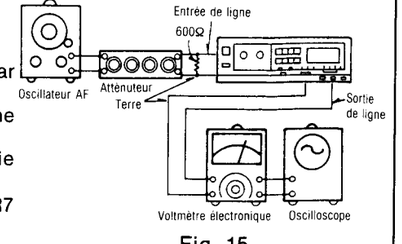


Fig. 15

Ⓗ Vumètre fluorescent

Condition:
- Mode d'enregistrement
- Contrôles de niveau d'entrée: MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscilloscope AF

• Vérification du vumètre fluorescent

Pour vérifier le degré de précision du vumètre fluorescent, mesurer le niveau de sortie sur la borne LINE OUT.

1. Brancher les appareils comme indiqué dans la Fig. 5.
2. Appliquer un signal de 1 kHz (−24dB) à la borne LINE IN, alors que l'unité est en mode de pause d'enregistrement.
3. Régler l'attenuateur de sorte que le niveau de sortie sure la borne LINE OUT soit de 0,4±0,05V.

Vérification de l'allumage et de l'extinction du segment 0dB du vumètre fluorescent

Changer le niveau de sortie sur la borne LINE OUT de la valeur 0,35V à la valeur 0,45V en réglant l'atténuateur. Vérifier que le segment 0dB du vumètre fluorescent s'allume alors.

Vérification de l'allumage et de l'extinction du segment −40dB du vumètre fluorescent

Abaisser le niveau de signal de 28dB en-dessous du niveau d'entrée standard (−24dB−28dB=−52dB=2,5mV); l'abaisser à nouveau d'une valeur de 12dB (−52dB−12dB=−64dB=0,63mV) en réglant l'atténuateur. Lors de l'abaissement du niveau de signal comme indiqué ci-sessus, vérifier que seul le segment −40dB du vumètre fluorescent rest allumé et qu'il s'obscurcisse ou s'éteigne au niveau le plus bas.

• Réglage du vumètre fluorescent

1. Brancher les appareils comme indiqué dans la Fig. 15.
2. Appliquer un signal de 1 kHz (−24dB) à la borne LINE IN, alors que l'unité est en mode de pause d'enregistrement.
3. Régler l'atténuateur de sorte que le niveau de sortie sur la borne LINE OUT soit de 0,4±0,05V.

• Réglage à "−40 dB"

4. Régler l'atténuateur de sorte que le niveau réglé à la phase 3 soit réduit de 40dB.
5. A ce moment, vérifier que le segment −40dB s'obscurcisse (luminosité intermédiaire entre pleine luminosité et extinction: voir Fig. 16).
6. Si la luminosité du segmentn'est pas comme celle mentionnée à la phase 5 ci-dessus, régler le VR9.

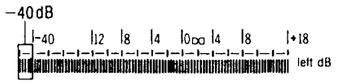


Fig. 16

• Réglage à "0 dB"

7. Rétablir les conditions de la phase 3 (niveau de sortie sur la borne LINE OUT de valeur 0,4±0,05V).
8. A ce moment, vérifier que le segment 0dB s'obsucurcisse (luminosité intermédiaire entre pleine luminosité et extenction: voir Fig. 17).
9. Si la luminosité du segment n'est pas come indiqué ci-dessus, régler le VR10.
10. Répéter les réglage et vérifications des phases 3, 4, 5, 6, 7, 8 et 9 deux ou trois fois.

Fig. 17

Ⓘ Circuit de réduction de bruit Dolby

Condition:
- Mode d'enregistrement
- Interrupteur de réduction de bruit Dolby...IN/OUT
- Interrupteur de sélection du système de réduction de bruit Dolby...B/C
- Contrôles de niveau d'entrée...MAX
- Contrôle de l'équilibre ...Centre

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)

Côté enregistrement

• Vérification des caractéristiques du codeur de type Dolby-B

1. Brancher les appareils comme indiqué dans la Fig. 18.
2. Placer l'unité sur le mode d'enregistrement. (L'interrupteur de sélection du système de réduction de bruit est sur la position OUT).
3. Appliquer un signal de 1kHz à la borne LINE IN.
4. Régler l'atténuateur de sorte que le niveau de sortie á la points 7 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de 12,3mV.
5. Le niveau de sortie à la pointe 21 devrait être de 0dB. (375mV)
6. Placer l'interrupteur de sélection du système de réduction de bruit sur B et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) est de +6dB±2dB (760mV).

7. Placer l'interrupteur de sélection du système de réduction de bruit sur la position OUT et régler la fréquence sur 5kHz. Le niveau du signal de sortie à la pointe 21 devrait être de 0dB (375mV).
8. Placer l'interrupteur de sélection du système de réduction de bruit sur la position B et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de +8dB±2dB (960mV).

• Vérification des caractéristiques du codeur de type Dolby-C

9. Répéter les phases 1 à 5 ci-dessus.
10. Placer l'interrupteur de sélection du système de réduction de bruit Dolby sur la position C et s'assurer que le niveau de signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de 11,5dB±2dB (1,5V).
11. Placer l'interrupteur de sélection du système de réduction de bruit sur la position OUT et régler la fréquence sur 5kHz. Le niveau du signal de sortie à la pointe 21 devrait être de 0dB (375mV).
12. Placer l'interrupteur de sélection du système de réduction de bruit sur la position C et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de +8,5dB±2dB (980mV).

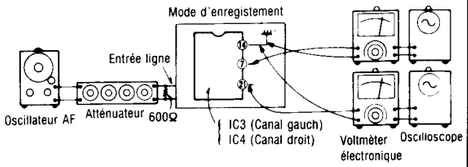


Fig. 18

Ⓙ Réglage du temps de recouvrement à l'attaque (circuit dbx)

Condition:
- Mode d'enregistrement
- Contrôle de niveau d'entrée...MAX
- Sélecteur de réduction de bruit...position de bande dbx
- Contrôle de l'équilibre...Centre

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur AF
- Voltmètre CC

Côté enregistrement

1. Faire les branchements comme indiquè dans la Fig. 19 et appliquer un signal de 1kHz−27dB à la borne LINE IN. Placer le sélecteur de réduction de bruit sur la position de bande dbx.
2. Placer l'unité sur le mode d'enregistrement. Régler l'atténuateur de sorte que le niveau de signal à C115 (canal gauche) et à C116 (canal droit) soit de 300 mV.
3. Lire la tension indiquée sur le voltmètre CC.

VALEUR DE RÉFÉRENCE: 15±0,5mV

4. Si la valeur lue ne correspond pas à la valeur de référence, régler VR14.

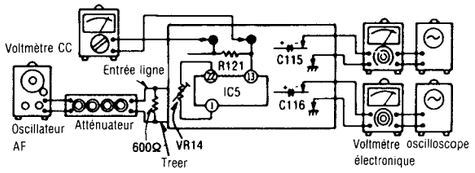


Fig. 19

Ⓚ Circuit du photodétecteur

Condition:
- Mode de lecture

Nota:

Lors du réglage du circuit du photodétecteur, laisser en place le panneau frontal, le couvercle de la cassette et la plaque indicatrice.
(Un éclairage externe risque de provoquer un fonctionnement défectueux du photodétecteur dans le dispositif du support de cassette et de rendre impossible un réglage précis.)

Réglage de la sensibilité

Un fonctionnement défectueux, tel qu'un arrêt automatique ou une marche en arrière de la bande, risque parfois de survenir pendant le défilement de la bande selon le modèle et la fabrication de la bande. Si le dérangement n'est provoqué que par des plissements de la bande, effectuer les réglages suivants.

1. Tout en faisant jouer la section provoquant le fonctionnement défectueux, régler VR13 de telle sorte qu'un fonctionnement normal soit obtenu.
2. Puis, faire jouer la section du début de la bande et vérifier si le fonctionnement est normal. (de telle sorte que l'arrêt automatique et que la marche en arrière de la bande soient éliminés).

ESPAÑOL

Sirvase utilizarse junto con manual de servicio para el model No. RS-B49R.

■ ESPECIFICACIONES TECNICAS

ESPAÑOL

Sistema de platina	Platina de a cassette estéreo
Sistema de pistas	4 pistas, 2 canales
Cabezas de GRAB/REPROD	Cabeza de MX
Cabezas de borrado	Cabeza de ferrita de 2 entrehierros
Motores	1 motor
Frecuencia de polarización	80 kHz
Sistema de borrado	Polarización de CA
Velocidad de cinta	4,8 cm/seg.
Respuesta de frecuencia	
Metal	20 Hz~17.000 Hz
	30 Hz~17.000 Hz (DIN)
	40 Hz~16.000 Hz±3 dB
CrO_2	20 Hz~17.000 Hz
	30 Hz~16.000 Hz (DIN)
	40 Hz~15.000 Hz ±3 dB
Normal	20 Hz~16.000 Hz
	30 Hz~15.000 Hz (DIN)
	40 Hz~14.000 Hz±3 dB
Gama dinámca (con dbx)	110 dB (1 kHz)
Señal a ruido (niveau de señal=nivel de grabación máx. tipo de cinta CrO_2)	
con dbx	92 dB (promedio A)
con reducción de ruidos Dolby C	75 dB (CCIR)
con reducción de ruidos Dolby B	67 dB (CCIR)
sin reducción de ruidos	57 dB (promedio A)
Variación de velocidad	0,08% (WRMS)
	±0,14% (DIN)
Máxima mejora de nivel de entrada (con dbx)	10 dB (1 kHz)
Tiempo de avance rápido y rebobinado	90 segundos con cintas C-60
Sensibilidad de entrada e impedancia	
MIC	0,25 mV/400Ω~10 kΩ
LINE	60 mV/47 kΩ
Voltaje de salida e impedancia	
LINE	400 mV/1,5 kΩ
HEADPHONES	80 mV/8Ω
Consumo de corriente	20 W
Fuente de alimentación	CA de 50/60 Hz, 220 V para Europa excepto el Reino Unido, 110/127/220/240 V, voltaje prefijado a 240 V en las demás regiones.
Dimensions (An.×Al×Prof.)	430×100,5×229,5 mm
Peso	3,7 kg

NOTAS: Colocar los interruptores y controles en las posiciones siguientes a no ser que se especifique lo contrario:
- Asegurarse de que las cabezas estén limpias.
- Asegurarse de que los cabrestantes y los rodillos presores estén limpios.
- Temperatura ambiente aconsejable: 20±5°C (68±9°F)
- Interruptor de comienzo de temporizador: OFF
- Controles del nivel de entrada: Máximo
- Interruptor NR (de reducción de ruido): OUT
- Interruptor de mode: ⟲ mode
- Interruptor de salto en blanco: OFF

■ METODOS DE AJUSTTE Y MEDIDA

Ⓐ Ajuste de azimut de las cabezas

Condición:
- Modo de reproducción (En avance • En retroceso)

Equipo:
- (EVM) Voltimetro electrónico
- Oscilloscopio
- Cinta de prueba (azimut) ...QZZCFM
- Cinta de prueba...QZZCRD

Ajuste del equilibrio de salida L-CH/R-CH (canal izquierdo/canal derecho)

1. Efectuar las conexiones como muestra la Fig.2.
2. En el modo de reproducción en avance, reproducir la señal de 8kHz desde la cinta de prueba (QZZCFM). Ajustar el tornillo del azimut (en avance) mostrado en la Fig. 3 para conseguir los máximos niveles de salida L-CH y R-CH. Cuando los niveles de salida de L-CH y R-CH no están al máximo, al mismo tiempo, reajustar de la siguiente forma:

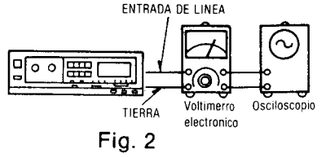


Fig. 2

3. Girar el tornillo del azimut (en avance) mostrado en la Fig. 3 para encontrar los ángulos A y C (puntos en los que se obtienen los niveles de salida en cresta para los canales izquierdo y derecho. Localizar después el ángulo B entre los ángulos A y C; por ej., el punto en el que las salidas L-CH y R-CH estén equilibradas. (Consultar las Fig. 3 y 4)
4. En el modo de reproducción en retroceso, ajustar el tornillo del azimut (en retroceso) del mismo mode que se ha descrito antes.

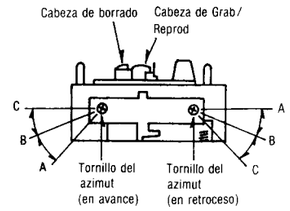


Fig. 3

Ajuste de fase de L-CH/R-CH

5. Efectuar las conexiones como muestra la Fig. 5.
6. En el modo de reproducción en avance, reproducir la señal de 8kHz desde la cinta de prueba (QZZCFM). Ajustar el tornillo del azimut (en avance) mostrado en la Fig. 3 de forma que las agujas de los dos EVM oscilen hasta el máximo y una forma de onda de Lissajoues, tal como la ilustrada en la Fig. 6, se obtenga en el osciloscopio.
7. En el modo de reproducción en retroceso, ajustar el tornillo del azimut (en retroceso) del mismo mode que se ha descrito antes.

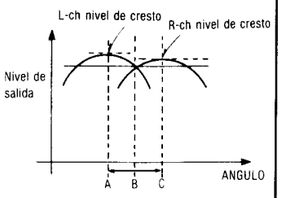


Fig. 4

Verificación de la diferencia de nivel entre el recorrido en avance y en retroceso

8. Reproducir la señal de ajuste del nivel de reproducción (315Hz a 0dB) en la cinta de ajuste de reproducción normal, y comprobar que la diferencia entre el nivel del recorrido en avance y del recorrido en retroceso está dentro de los 1,0dB.
9. Después del ajuste, bloquear los tornillos de ajuste del ángulo y de la altura de la cabeza de borrado.

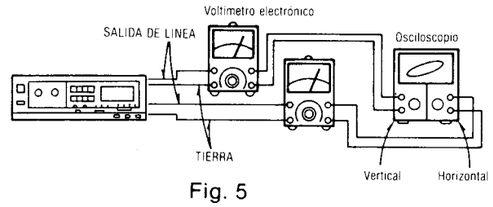


Fig. 5

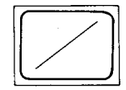
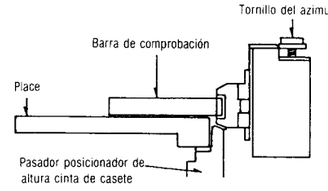
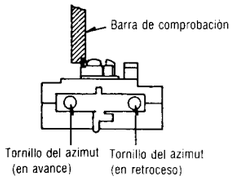


Fig. 6

Ajuste de la altura de la cabeza usando el posicionador de ajuste de la cabeza (QZZ0207)

El posicionador de ajuste de la cabeza (QZZ0207) hace posible un ajuste rápido y preciso de la altura de la cabeza de la forma siguiente:
a. Colocar la placa sobre el mecanismo.
b. Colocar el mecanismo en el modo PLAY (reproducción).
c. Colocar la barra de prueba sobre la placa.
d. Pasar la barra de prueba a través de cada cabeza de borrado.
e. Ajustar el tornillo de la altura de forma que la barra de prueba no toque ninguna de las cabeza de borrado.
f. Reproducir la cinta con espejo (QZZCRD) y comprobar viéndolo que la cinta no toca (ni da la vuelta, etc.) las cabezas de borrado.
g. Después, ajustar los puntos 1 a 7 del procedimiento de ajuste.





Ⓑ Velocidad de la cinta

Condición:
- Modo de reproducción

Equipo:
- Contador digital electrónico
- Cinta de prueba...QZZCWAT

Exactitud de la velocidad de cinta

1. La conexión del equipo de prueba se muestra en Fig. 7.
2. Reproducir la cinta de prueba (QZZCWAT 3.000Hz), y suministrar una señal de reproducción al contador digital electrónico.
3. Medir esta frecuencia.
4. Sobre la base de 3.000Hz, determinar el valor de la exactitud mediante la siguiente fórmula:

$$\text{Exactitud de la velocidad de cinta} = \frac{f-3.000}{3.000}\times 100(\%)$$

donde f = valor medido

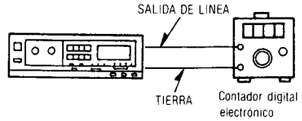


Fig. 7

5. Tomar medida en la sección media de la cinta.

Valor normal: 0,33% (3000±10%)

6. Si el valor medido no está dentro del valor estándar, ajustarlo usando el ajuste de velocidad de cinta VR mostrado en la Fig. 1.

Nota: No utilizar destornilladores metálicos cuando ajuste la precisión de la velocidad de la cinta en este aparato.

Fluctuación de la velocidad de cinta

Efectuar las mediciones de la misma manera que antes (al comienzo, mitad y final de la cinta) y determinar la diferencia entre los valores máximo y mínimo. Calcular de la forma siguiente:

$$\text{Fluctuación de la velocidad de cinta} = \frac{f_1 - f_2}{3.000} \times 100(\%)$$

f_1 = valor máximo,
f_2 = valor mínimo

Valor normal: menos de 1,5%

Ⓒ Respuesta de frecuencia de reproducción

Condición:
- Modo de reproducción (En avance • Enretroceso)

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio
- Cinta de prueba...QZZCFM

1. La conexión del equipo de prueba se muestra en la Fig. 2.
2. Reproducir la cinta de prueba de respuesta de frecuencia (QZZCFM).
3. Medir el nivel de salida en 315Hz, 12,5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz y 63Hz y comparar cada nivel de salida con 315Hz de frecuencia normal, en LINE OUT.
4. Efectuar las medidas para ambos canales.
5. Asegurarse de que el valor medido está comprendido dentro de la gama especificada en el gráfico de la respuesta de frecuencia (mostrado en la Fig. 8).

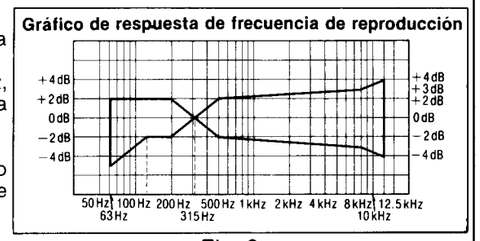


Fig. 8

Ⓓ Ganancia de reproducción

Condición:
- Modo de reproducción (En avance • Enretroceso)

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio
- Cinta de prueba...QZZCFM

1. La conexión del equipo de prueba se muestra en la Fig. 2.
2. Reproduzca la porción de nivel de grabación estándard en la cinta de prueba (QZZCFM 315Hz) y, usando EVM (voltímetro electrónico), mida el nivel de salida en "LINE OUTs" (salidas de línea).
3. Efectuar las medidas para ambos canales.

Valor normal: 0,4V±0,05V

Ajuste

1. Si el valor medido no está comprendido dentro del valor normal, ajustar VR5 (L-CH), VR6 (R-CH).
2. Despues del ajuste, comprobar de nuevo la "respuesta de frecuencia de reproducción".

Ⓔ Corriente de borrado

Condición:
- Modo de grabación

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio
- Cinta de prueba (Cinta en blanco de referencia) ...QZZCRZ para Metal

1. La conexión del equipo de prueba se muestra en la Fig. 9.
2. Insertar la cinta de prueba virgen de referencia metálica (QZZCRZ).
3. Apretar los botones de pausa y grabación.
4. Tomar la lectura del voltaje en EVM y calcular la corriente de borrado mediante la fórmula siguiente:

$$\text{Corriente de borrado (A)} = \frac{\text{Voltaje entre terminales de R198}}{1\ (\Omega)}$$

Valor normal: 190 $^{+10}_{-15}$mA (Modo de cinta...Metal) (190 $^{+10}_{-15}$ mV)

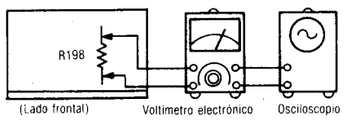


Fig. 9

5. Si el valor medido no está comprendido dentro del valor normal, ajustar de la forma siguiente:

Ajuste

1. Cortocircuitar los registros R200, R201, R202. (Referir a la Tabla 1)
2. Medir la corriente de borrado.
3. Si el valor medido no cae dentro del régimen nominal, abrir o cortocircuitar los registros R200, R201, R202 de acuerdo con la Tabla 1.

R200	R201	R202	Combio en valor	Illustración
Cortocir-cuitar	Cortocir-cuitar	Cortocir-cuitar	±0mA	R200 R201 R202 Soldado
Cortocir-cuitar	Cortocir-cuitar	Abrir	+4mA	R200 R201 R202 Soldado
Abrir	Cortocir-cuitar	Cortocir-cuitar	+10mA	R200 R201 R202 Soldado
Abrir	Abrir	Abrir	+20mA	R200 R201 R202

Table 1

Ⓕ Respuesta de frecuencia total

Condición:
- Modo de reproducción/ grabación
- Modo de cinta normal
- Modo de cinta CrO_2
- Modo de cinta Metal
- Control de nivel de entrada ...MAX

Equipo:
- EVM (Voltímetro electrónico)
- ATT
- Oscilador de AF
- Osciloscopio
- Resistor (600Ω)
- Cinta de prueba (cinta en blanco de referencia) ...QZZCRA para Normal ...QZZCRX para CrO_2 ...QZZCRZ para Metal

Nota:

Antes de medir y ajustar la respuesta de frecuencia total, asegurarse de la respuesta de frecuencia de reproducción. (Para el método de medida, sírvase consultar la respuesta de frecuencia de reproducción).
(Se fija el compensador de grabación.)

1. Efectuar las conexiones tal como se muestra en la Fig. 11.
2. Poner la UNIDAD en el modo de cinta normal y cargar la cinta de prueba (QZZCRA).
3. Aplicar una señal de 1kHz desde el oscilador de AF a través de ATT a LINE IN.
4. Ajustar el ATT de forma que el nivel de entrada sea de −20dB por debajo del nivel estándar de grabación (nivel estándar de grabación = 0VU).
5. Ajustar el oscilador de AF para generar señales de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz y 12,5kHz y grabar, estas señales en la cinta de prueba.
6. Reproducir las señales grabadas en el paso 6, y comprobar si la curva de respuesta de frecuencia está dentro de los límites mostrados en el gráfico de respuesta de frecuencia total para las cintas normales (Fig. 10).
(Si la curva está dentro de las especificaciones del gráfico, sequir con los pasos 7, 8 y 9).
Si la curva no está dentro de las especificaciones del gráfico, ajustar de la forma siguiente:

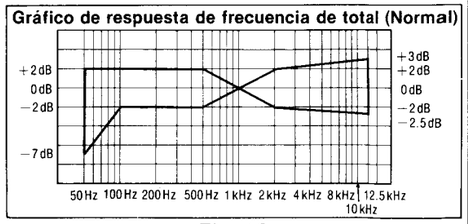


Fig. 10

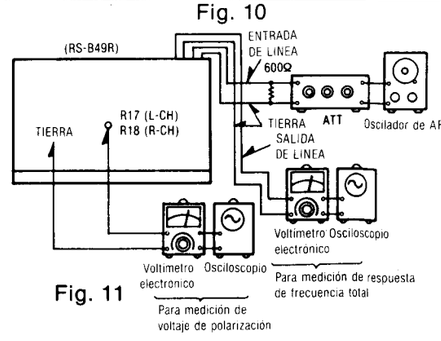


Fig. 11

Ajuste A:

Cuando la curva excede las especificaciones del gráfico de respuesta de frecuencia total (Fig. 10) tal como se muestra en la Fig. 12.

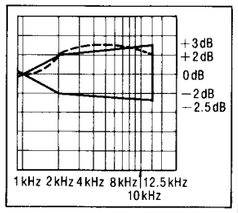


Fig. 12

1) Aumentar la corriente de polarización girando VR11 (L-CH) y, VR12 (R-CH).
2) Repetir los pasos 5 y 6 para confirmación. (Seguir con los pasos 7, 8 y 9 si la curva está ahora dentro de las especificaciones del gráfico de la Fig. 10).
3) Si la curva todavía excede las especificaciones (Fig. 10), aumentar aún más la corriente de polarización y repetir los pasos 5 y 6.

Ajuste B:

Cuando la curva está por debajo de las especificaciones del gráfico de respuesta de frecuencia total (Fig. 10) tal como se muestra en la Fig. 13.

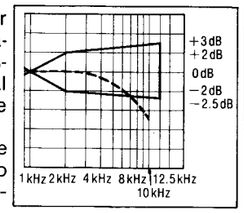


Fig. 13

1) Reducir la corriente de polarización girando VR11 (L-CH) y, VR12 (R-CH).
2) Repetir los pasos 5 y 6 para confirmación. (Seguir con los pasos 7, 8 y 9 si la curva está ahora dentro de las especificaciones del gráfico de la Fig. 10.)
3) Si la curva todavía cae por debajo de las especificaciones del gráfico (Fig. 10), reducir aún más la corriente de polarización y repetir los pasos 5y 6.

7. Poner la UNIDAD en el modo de cinta CrO_2.
8. Cambiar la cinta de prueba a QZZCRX y grabar señales de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz y 14kHz. Luego, reproducir las señales y comprobar si la curva está dentro de los límites mostrados en el gráfico de respuesta de frecuencia total para las cintas CrO_2 (Fig. 14).
9. Poner la UNIDAD en modo de cinta a Metal y cambiar la cinta de prueba a QZZCRZ, y grabar señales de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz y 14kHz. Luego, reproducir las señales y comprobar si la curva está dentro de los limites mostrados en el gráfico de respuesta de frecuencia total para las cintas de Metal (Fig. 14).
10. Asegurarse de que las tensión de polarización sean aproximadamente las que se indican a continuación cuando el aparato esté colocado en un modo de cinta distinto.

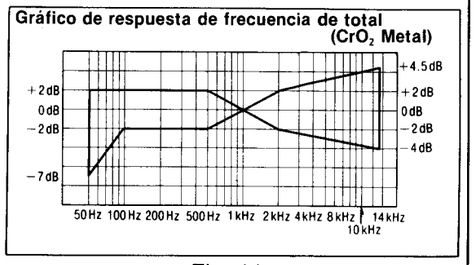


Fig. 14

- Lea el voltaje en los terminales del resistor R17 (L-CH) [R18 (R-CH)] y calcule la corriente de polarizaciòn de la fòrmula siguiente.

$$\text{Corriente de polarización (A)} = \frac{\text{Valor leido en el EVM (V)}}{10\ (\Omega)}$$

Valor de referencia:	**Unos 420μA (posición Normal)** **Unos 560μA (posición CrO_2)** **Unos 900μA (posición Metal)**

G Ganancia total

Condición:
- Modo de reproducción/ grabación
- Modo de cinta Normal
- Controles del nivel de entrada ...MAX.
- Nivel de entrada normal:

MIC .....$-72\,^{+5}_{-3}$dB (0,25mV)

LINE IN .....−24±4dB (60mV)

Equipo:
- EVM (Voltímetro electrónico)
- Oscilador de AF
- ATT
- Osciloscopio
- Resistor (600Ω)
- Cinta de prueba (cinta en blanco de referencia) ...QZZCRA para Normal

1. La conexión del equipo de prueba se muestra en la Fig. 5.
2. Cargar la cinta normal en blanco de referencia (QZZCRA).
3. Poner el aparato en el modo grabación.
4. Suministrar una señal 1kHz (−24dB) desde el oscilador de AF a través de ATT a LINE IN (ENTRADA DE LINEA).
5. Ajuster ATT hasta que el nivel del monitor en "LINE OUTs" sea 0,4±0,05V.
6. Reproduzca la cinta grabada y asegurese de que el nivel de salida en "LINE OUTs" sea 0,4±0,05V.
7. Si el valor medido no es de 0,4±0,05V, ajustarlo con VR7 (L-CH), VR8 (R-CH).
8. Repetir desde el punto (2).

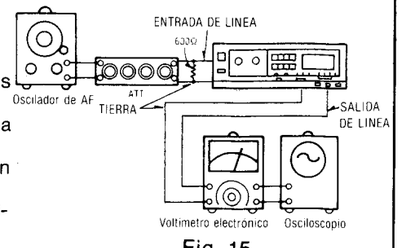


Fig. 15

H Medidor fluorescente

Condición
- Mode grabación
- Controles del nivel de entrada: MAX

Equipo:
- EVM (Voltimetro electrónico)
- Oscilador de AF
- ATT

• Comprobación del medidor fluorescente (FL)

Para comprobar la precisión del medidor FL, medir el nivel de salida en LINE OUT.
1. Efectuar las conexiones tal como se muestra (ver la Fig. 15).
2. En el modo de pausa durante la grabación, aplicar 1kHz (−24dB) a LINE IN.
3. Ajustar el ATT de forma que el nivel de salida en LINE OUT sea de 0,4±0,05V.

Comprobación del encendido/apagado del segmento 0dB del medidor FL

Cambiar el nivel de salida en LINE OUT de 0,35V a 0,45V ajustando el atenuador, y comprobar si el estado de apagado del segmento 0dB del medidor FL cambia al estado de encendido.

Comprobación del encendido/apagado del segmento −40dB del medidor FL

Disminuir el nivel de la señal de 28dB por debajo del nivel de entrada normal (−24dB−28dB=−52dB=2,5mV) y disminuir luego aún más el nivel de 12dB (−52dB−12dB=−64dB=0,63mV) ajustando el atenuador. Al mismo tiempo que se baja el nivel según se ha descrito arriba, asegurarse de que solamente el segmento de −40dB permanece encendido, luego se atenúa o se apaga al nivel más bajo.

• Ajuste del medidor fluorescente
1. Efectura las conexiones tal como se muestra (ver la Fig.15).
2. En el modo de pausa durante la grabación, aplicar 1 kHz (−24dB) a LINE IN (ENTRADA DE LINEA).
3. Ajustar ATT de forma que el nivel de salida en LINE OUT sea de 0,4±0,05V.

• Ajuste a "−40 dB"

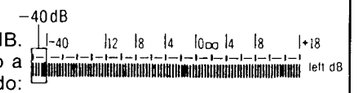


Fig. 16

4. Ajustar ATT de forma que el nivel ajustado en el paso 3 se reduzca en 40dB.
5. En este momento, comprobar si el indicador de −40dB está iluminado a medias (intensidad luminosa intermedia entre intensidad máxima y apagado: ver la Fig. 16).
6. Si el indicador no esta iluminado a medias tal como se ha descrito en el paso 5, ajustar VR9.

• Ajuste a "0 dB"

Fig. 17

7. Volver a las condiciones del paso 3 (hacer que el nivel de salida en LINE OUT sea de 0,4±0,05V).
8. En este momento, comprobar si el indicador de 0dB está iluminado a medias (intensidad luminosa intermedia entre intensidad máxima y apagado: ver la Fig. 17).
9. Si no es asi, ajustar VR10.
10. Repetir los ajustes y comprobaciones de los pasos 3, 4, 5, 6, 7, 8 y 9 dos o tres veces.

I Circuito Dolby de de ruido (NR)

Condición:
- Modo de grabación
- Interruptor Dolby NR ...IN/OUT
- Interruptor selector del Dolby NR...B/C
- Controles del nivel de entrada...MAX
- Control del balance...Centro.

Equipo:
- EVM (Voltímetro electrónico)
- ATT
- Resistor (600Ω)
- Oscilador de AF
- Osciloscopio

Lado de grabación

• Comprobación de las caracteristicas del condificador tipo Dolby B.
1. Efectuar las conexiones segun se muestra en la Fig. 18.
2. Colocar la unidad en el modo de grabación (el interruptor selector NR está en OUT).
3. Aplicar una señal de 1kHz a LINE IN.
4. Ajustar el ATT de forma que el nivel de salida en el terminal 7 del IC3 (L-CH) e IC4 (R-CH) sea de 12,3mV.
5. El nivel de salida en el terminal 21 deberá ser de 0dB (375mV).
6. Colocar el interruptor selector NR en B, y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +6dB±2dB (760mV).
7. Colocar el interruptor NR en OUT y ajustar la frecuencia a 5kHz. El nivel de la señal de salida en el terminal 21 deberá ser de 0dB (375mV).
8. Colocar el interruptor selector NR en B y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +8dB±2dB (960mV).

• Comprobación de las caracteristicas del codificador tipo Dolby C.

9. Repetir los pasos 1 a 5 anteriores.
10. Colocar el interruptor selector NR en C y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +11,5dB±2dB (1,5V).
11. Colocar el interruptor selector NR en la posición OUT y ajustar la frecuencia a 5kHz. La señal de salida en el terminal 21 deberá ser de 0dB (375mV).
12. Colocar el interruptor selector NR en C, y asegurarse de que el nivel de la señal de salida del terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +8,5dB±2dB (980mV).

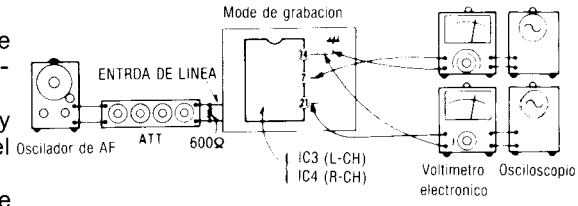


Fig. 18

J Ajuste del tiempo de recuperación de ataque (circuito dbx)

Condición:
- Modo de grabación
- Controles del nivel de entrade...MAX
- Selector de reducción de ruido...cinta dbx
- Control del balance...Centro

Equipo:
- EVM (Voltimetro electrónico)
- ATT
- Oscillador de AF
- Voltimetro de CC

Lado de grabación

1. Hacer las conexiones que se muestran en la Fig. 9 y suministrar una señal de 1 kHz–27dB desde LINE IN. Colocar también el selector de reducción de ruido en la posición de cinta dbx.
2. Colocar la unidad en el modo de grabación, y ajustar ATT de forma que el nivel de la señal en C115 (L-CH) y C116 (R-CH) sea de 300 mV.
3. Leer el voltaje en el voltímetro de CC.

VALOR DE REFERENCIA: 15±0,5mV

4. Si el valor medido no está comprendido dentro del valor de referencia, ajustor VR14.

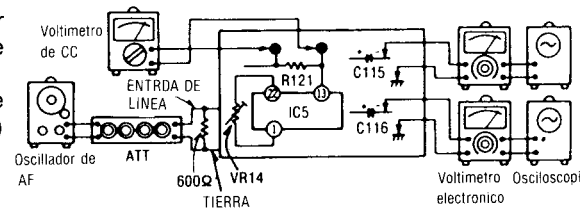


Fig. 19

K Circuito fotosensor

Condición:
- Modalidad de reproducción

Nota:
Al ajustar el circuito fotosensor, deje en su lugar el panel frontal, tapa de cassette y placa indicadora.
(Una luz exterior puede hacer que funcione mal el fotosensor e imposibilite un ajuste preciso.)

Ajuste de sensibilidad
Algunos malfuncionamientos, tales como inversión o autoparada de cinta, algunas veces pueden ocurrir durante el movimiento de cinta según el tipo y fabricación de cinta. Si el trastorno es causado sólo por arrugas de cinta, efectúe los siguientes ajustes.

1. Mientras toca la sección que causa malfuncionamiento, ajuste VR13 de manera que se obtenga la operación normal.
2. Luego toque la sección de cinta guía y compruebe por operación normal (que se eliminen la inversión y autoparada de cinta).